

# BRIEFER

No. 40 | August 3, 2016

---

## A Storm Without Rain: Yemen, Water, Climate Change, and Conflict

*Collin Douglas*

---

The civil war in Yemen has old origins. However, the recent violence can be traced back to the Arab Spring of 2011, and protests in Yemen over unemployment, corruption, and general dissatisfaction with Yemeni President Ali Abdullah Saleh.<sup>1</sup> There are many actors and many motives, but on the surface the civil war seems to be a politically-motivated competition for power. However, underneath the obvious political and societal tensions, there lies a more basic tension: water.

The Syrian civil war has been held up as one of the first clear examples of a large-scale armed conflict wherein resource scarcity, linked to climate change and natural resource mismanagement, played a role.<sup>2</sup> Yemen, though less visible in the headlines, faces strikingly similar risks. Water scarcity in Yemen which has been exacerbated by climate change, may be a critical factor underlying the country's instability, and pro-

longing and worsening its conflict. Fuel prices, closely linked to the price of water in Yemen, helped spark the protests in 2014.<sup>3</sup> Scarcity has made the humanitarian situation in Yemen, especially its cities, much worse since the beginning of the conflict.<sup>4</sup> Yemen is among the most water-stressed countries in the world, brought on by regional drought, a naturally dry climate, and failed attempts at management.<sup>5</sup> The broader Middle East drought has had far-reaching effects, and Yemen has been particularly affected.<sup>6</sup> Like other unstable situations in the region, climate change may be an exacerbating factor in the country's instability, not a primary cause, and to what extent is uncertain. In a landscape of rising populations, severe unemployment, political instability, an active and influential terrorist organization, outside interests, and dwindling water and food resources, a changing climate is likely making matters worse.

## **Dwindling water supplies, a population boom, and Qat**

The IPCC, while highlighting a need for more climate data on West Asia in their 2014 report, has recognized an increase in average temperatures and a slight decrease in annual precipitation.<sup>7</sup> A World Bank report from 2014, which depicts a regional drying trend over the past few decades, actually predicts a slight increase in precipitation for Yemen in the future, but this increase will be offset due to evaporation from increased temperatures.<sup>8</sup> There is also no evidence that population growth will slow down, lessening any benefit from future precipitation. In a region with little precipitation to begin with, small changes can have big impacts. Yemen's climate was dry before climate change, and it seems to be getting drier with climate change. For centuries, Yemenis have lived in a very delicate balance with their arid surroundings. Yemeni farmers have long relied on traditional methods of obtaining and managing their naturally scarce water resources. With the introduction of deep tube wells, aquifers could be tapped at an unprecedented rate. This change led to a massive growth in cultivated farmland; increasing 1000% between 1970 and 2004.<sup>9</sup> The groundwater level has not been replenished at the same rate as withdrawal, with freshwater withdrawals making up 168% of the total renewable water resources.<sup>10</sup>

Yemen has had one of the highest population growth rates in the world in recent years, growing by nearly 25% from 2006 to 2014.<sup>11, 12</sup> This massive growth has put a strain on an already stressed water supply. An extra five million people need food and water, and there has been no equal increase in economic growth.<sup>13</sup> A high youth

population is understood as a major contributing factor to political unrest across the Middle East, and Yemen is no exception.<sup>14</sup> Roughly 60% of Yemen's population is under the age of 24.<sup>15</sup> This statistic, combined with large unemployment and significant water insecurities, set the stage for unrest.<sup>16</sup>

The growth in population and increased water usage in Yemen coincided with the development of a cash economy in Yemen, which led to farmers relying more heavily on water-intensive cash crops. Qat, a mild stimulant chewed by many in Yemen, is a cornerstone of the Yemeni economy. A report from 2010 estimated that "Qat production now accounts for 37 percent of all water used in irrigation" and makes up roughly 6% of Yemen's GDP.<sup>17</sup> However, Qat does not fill the stomachs of hungry Yemenis. With fewer edible crops being grown domestically, access to food drops in step. With more water being used up by agriculture, there is less to drink. Many have predicted a severe crisis in Yemen, with some even predicting the country being completely dry by 2015, and others predicting that the capital Sana'a will be dry by 2020.<sup>18</sup>

A recent study finds that the likelihood of armed conflict "is enhanced by climate-related disaster occurrence in ethnically fractionalized countries."<sup>19</sup> This study's findings seem to mirror the situation in Yemen and strengthen the claim that climate disasters such as drought can contribute to violence, especially in ethnically divided countries. The study also notes several other contributing factors, such as poverty, weak governance, and a history of conflict that are also present in Yemen.

## **The civil war and water**

The civil war in Yemen is a complex and bewildering conflict. The players include Houthi rebels, al-Qaeda in the Arabian Peninsula, western backed Saudi and UAE troops, mercenaries, and millions of Yemeni civilians caught in the middle.<sup>20 21</sup> Local and Tribal conflicts are not new to Yemen, but these have increased in recent decades.<sup>22</sup> Water affects the whole picture. Yemen has been on the razor's edge when it comes to their water supply in recent years, and supplies are dwindling further. Climate change-exacerbated drought, inefficient management techniques, overpopulation, dependence on a water-intensive plant used as a narcotic, poor governance and the persistence of tribal grievances are all coming together to drive the current crisis.

Historically, water conflicts are not new in Yemen. There have been instances of local and tribal water conflicts going back decades, though more so before the 1970s.<sup>23</sup> As climate change places additional strains on water security, however, conflict over water could increase in likelihood. In rural Yemen, identity is very much connected to land and water rights, and conflicts over these rights could be the spark for larger tribal disputes.<sup>24</sup> It is therefore no surprise that the pressure is being felt locally from the lowering water supplies. The Yemeni government has made attempts to address water issues, but these attempts have mostly failed. In the late 1990s and early 2000s the Yemeni government implemented, "at least five demand management measures: increases in the diesel price (that were rapidly overtaken by inflation); elimination of credit subsidies for agriculture; modification of the fruit and vegetable ban; regulation and taxation of groundwater; and projects to support increased water productivity in agricul-

ture."<sup>25</sup> Despite these measures, the Yemeni government lacked an effective tool to implement and enforce them.

It is unclear just how much the water crisis contributed to causing the current war, and how much can be attributed to the more mainstream political struggle in Yemen. But a report from 2009 notes several ingredients for civil unrest: water scarcity so severe that it threatens survival and agricultural livelihoods, increases tribal disputes over water, and large numbers of unemployed and armed young men.<sup>26</sup>

Water shortages have increasingly been at the center of humanitarian concerns during the civil war. There have been reports of both the Houthi and Saudi forces blocking deliveries of humanitarian aid consisting of food and water.<sup>27</sup> In February 2016, there were reports that Saudi planes bombed and destroyed a reservoir that held the drinking water for 30,000 Yemenis; roughly 5,000 cubic meters of water.<sup>28</sup> There have also been reports of guards confiscating water from civilians at Houthi-controlled checkpoints around the city of Taiz.<sup>29</sup> It is clear that neither side sees water resources as off-limits. The water shortages in Yemen have reached severe levels, raising "the total number of Yemenis without a clean water supply and sanitation to at least 16 million – almost two-thirds of the population" according to Oxfam data.<sup>30</sup> Houthi rebels have laid siege to the southern city of Taiz since April 2015, and residents of the city have had restricted access to medical supplies, food and water.<sup>31</sup> In a place as dry as Yemen, combatants are treating water as a resource to be withheld from the enemy.

The UNHCR reports that in 2014 there were as many as 334,000 internally-

displaced people in Yemen.<sup>32</sup> It is unclear how many of these people are displaced due to fighting, and how many due to water and food shortages, but it can be tentatively assumed that there is a mixture. Yemen may have had a chance to avert a disaster had war not erupted, but now that civil war is raging, a real solution to Yemen's water crisis seems out of reach.

### **Technical solutions**

One of the most recommended solutions to Yemen's water shortages is the development of desalination plants along the coast. Though this is a legitimate solution to explore, there are many reasons that desalination is not a sufficient solution in the near future. Firstly, instability in Yemen, which is likely to persist for many years, makes desalination infrastructure projects of the size needed to be built infeasible. Plants would be a likely target for groups trying to disrupt the process, and the necessary investments for such projects would be difficult to come by – either from the Yemeni government, or from outside financial institutions. Secondly, desalination projects are costly. Saudi Arabia has expressed a desire to lead the rebuilding of Yemen after the conflict, but because of Saudi Arabia's role in the conflict, there would likely be much domestic opposition to this. The Saudi Development Fund and the Yemeni government had begun the initial negotiations to build a Saudi-funded desalination plant for the city of Taiz before the escalation of the civil war, but the negotiations have stalled due to the conflict.<sup>33</sup> However, this deal does at least show a willingness by Saudi Arabia, a country with considerable desalination experience, to help Yemen overcome its water problems, which could also serve as a trust-building factor between the con-

flicting parties.<sup>34</sup> Thirdly, Sana'a is not near the coast and would require an extensive pipeline to bring desalinated water into the city. The likely high costs and insecurity of a pipeline to Sana'a could leave the city without a water supply in the future; possibly forcing an abandonment of the city. This is not unthinkable; Minister for Water and the Environment Abdulrahman Al-Eryani suggested relocating residents of Sana'a to the coasts in 2007.<sup>35</sup>

With no end in sight to the fighting, large-scale technological solutions to water insecurity in Yemen seem unlikely to be sufficient. Thus far, Yemenis have turned to more low-tech and local solutions; collecting the condensation from fog has turned into a cheap way of shoring up water supplies.<sup>36</sup> These are vital adaptive solutions, but not enough in the face of a growing crisis.

### **Political solutions**

For technical solutions to Yemen's water crisis to even be considered, the political will and ability must be present. The right steps must be taken to address, across the country, the issue of water conservation and supply. Reforms have been made over the years to address Yemen's shortage problems, but those reforms have little to show. The Yemeni Ministry of Water and Environment was created in 2003 and tasked with supervising water management and supply. While this shows a will to address the water crisis, real changes are harder to find. As some have noted, the National Water Sector Strategy was important for the Yemeni water crisis. This plan, with its decentralized approach to water governance mirroring the decentralized nature of Yemeni society, was an important move in the

right direction for Yemen.<sup>37</sup> Despite an ambitious plan, the water crisis in Yemen is still dire. Also, the National Water Sector Strategy fails to account for the future impact of climate change on Yemen's water resources.<sup>38</sup>

The links between Yemen's severe water crisis and violence in the country have been talked about publicly since at least 2009, when then Minister of Environment and Water Abdulrahman al-Eyani said, "they manifest themselves in very different ways: tribal conflicts, sectarian conflicts, political conflicts. Really they are all about sharing and participating in the resources of the country, either oil, or water and land."<sup>39</sup> In this context, the future of a successful water governance structure, and a peaceful Yemen, is likely dependent on the on-going peace talks between the parties to the conflict. An effective water governance structure would require a capable government and secure funding. This is where the recognition of Yemen's water crisis as an exacerbating factor in the conflict within the country is vital. The international community has an interest in a lasting peace in Yemen, and that interest should carry over to the water crisis. The on-going peace talks in Kuwait have faced setbacks, and have not moved beyond recognizing parties and focusing on an end to fighting.<sup>40</sup> There is much to be done before a competent government can come to power and work towards addressing the water crisis. The only certainty in this process is that no large scale project can be entirely funded by Yemen. Foreign Minister Abdel-Malek al-Mekhlafi has hinted at an impending bankruptcy for Yemen.<sup>41</sup> The United States and Saudi Arabia, the two countries most concerned with the security situation in Yemen, are the like-

ly possible sources for climate-sensitive water infrastructure development in Yemen. USAID has provided humanitarian assistance to Yemen totaling \$317 million in 2015 and 2016.<sup>42</sup> While important, material aid treats the symptoms of the problem, not the cause.

There may be a silver lining to Yemen's water woes. Water is an equalizer. It does not take sides, and every side in the conflict relies on it. Rather than a source of conflict, water can be, and has been, a tool for bringing parties to a negotiation. In their Water Conflict Toolkit, for example, USAID claims that, "water projects can serve as opportunities to strengthen governance, enhance trust among affected parties and institutions, and create mechanisms for dialogue and dispute resolution."<sup>43</sup> In 2013, Jordan, Israel, and the Palestinian Authority signed an agreement to build a water desalination plant on the Red Sea coast that would provide drinking water to Southern Jordan, Southern Israel, and the Palestinian Territories.<sup>44</sup> Since the 1990s, Israeli and Palestinian representatives have been regularly meeting to make joint decisions concerning common water challenges between the two groups. This Joint Water Committee has created a source of constant contact, negotiation, and a sense of trust between authorities of both sides.<sup>45</sup> Addressing the far-reaching problems with Yemen's water resources could be a catalyst for bringing parties to the table to negotiate peace. A stable water source could give Yemen the economic stability to move past its current state. Addressing the water crisis together could be the first step toward peace between the Yemeni Government and the Houthis. A common threat is often the driver of the development of a common identity, and the

threat of severe water scarcity could bring the warring sides in the civil war together, if there is leadership to prompt it. Further, governments, international institutions and civil society organizations increasingly understand how cooperating on water issues can lead to cooperation elsewhere.<sup>46 47</sup>

In sum, there are a variety of motives and reasons for the current violence in Yemen, but underlying all other motives is the ongoing need by all parties to secure access to the last remaining drops of Yemen's quickly diminishing water supply. Local water shortages have coincided with several other critical political, economic and demographic factors to precipitate a full-scale civil war. During the war, the constant need for, and dispute over water has remained and even intensified. Yemen's water problems were present before the civil war, and will remain after the war. The future is uncertain, as it will take a massive effort to address the equally massive water problems Yemen faces. But such an effort is essential for a

peaceful Yemen. All sides sitting down to address the staggering water crisis in Yemen could be the first step to ending the civil war. Yemen provides an example of how devastating climate change can be on societies that do not have the capability, resources or political will to adapt. Without climate change, Yemen's many problems would likely still be present. However, climate change and its role in Yemen have likely worsened these problems, and will continue to exacerbate them in the future. While more information on Yemen's climate is needed to better understand the way reduced rainfall and increase heat will affect Yemen, it is clear that these changes will complicate instability in the country and the region. Water scarcity, with its many social by-products, will only continue to worsen without broad-ranging, actionable solutions that address core fragilities in the country, and that do so in a way that is sensitive to a changing climate.

*Collin Douglas is a Research Fellow with the Center for Climate and Security*

---

<sup>1</sup> "Yemen: Tens of Thousands Call on President to Leave," BBC News. January 27, 2011. <http://www.bbc.com/news/world-middle-east-12295864>.

<sup>2</sup> Francesco Femia and Catilin E. Werrell, "Syria: Climate Change, Drought and Social Unrest," The Center for Climate and Security, 2012.

<sup>3</sup> Zachary Laub, "Yemen In Crisis," Council on Foreign Relations. April 19, 2016. <http://www.cfr.org/yemen/yemen-crisis/p36488>.

<sup>4</sup> Alistair Dawber, "Yemen Crisis: Shortage of Water and Medical Supplies Threatens Civilians Caught up in Devastating Civil War," The Independent. April 9, 2015. <http://www.independent.co.uk/news/world/middle-east/yemen-crisis-shortage-of-water-and-medical-supplies-threatens-civilians-caught-up-in-devastating-10163600.html>.

<sup>5</sup> "Ranking the World's Most Water-Stressed Countries in 2040," World Resources Institute. August 26, 2015. <http://www.wri.org/blog/2015/08/ranking-world's-most-water-stressed-countries-2040>.

<sup>6</sup> World Bank, *Turn Down the Heat: Confronting the New Climate Normal* (Washington D.C., 2014): 125.

[http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2014/11/20/000406484\\_20141120090713/Rend ered/PDF/927040v20WP0000ull0Report000English.pdf](http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2014/11/20/000406484_20141120090713/Rend ered/PDF/927040v20WP0000ull0Report000English.pdf)

<sup>7</sup> Intergovernmental Panel on Climate Change, "5<sup>th</sup> Assessment Report: Impacts, Adaptation, and Vulnerability," Hijioka et al. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 1327-1370.

<sup>8</sup> World Bank, *Turn Down the Heat: Confronting the New Climate Normal* (Washington D.C., 2014) [http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2014/11/20/000406484\\_20141120090713/Rend ered/PDF/927040v20WP0000ull0Report000English.pdf](http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2014/11/20/000406484_20141120090713/Rend ered/PDF/927040v20WP0000ull0Report000English.pdf)

- 
- <sup>9</sup> Gerhard Lichtenthaeler, "Water Conflict and Cooperation in Yemen," Middle East Report, no. 254 (April 1, 2010): 30-35.
- <sup>10</sup> "Yemen Human Development Indicators," UNDP. <http://hdr.undp.org/en/countries/profiles/YEM>.
- <sup>11</sup> World Bank, "Population growth," <http://data.worldbank.org/indicator/SP.POP.GROW/countries/YE?display=graph>
- <sup>12</sup> World Bank, "Population, Total." <http://data.worldbank.org/indicator/SP.POP.TOTL/countries/YE?display=graph>.
- <sup>13</sup> World Bank, "GDP per capita growth (annual %)" <http://data.worldbank.org/indicator/NY.GDP.PCAP.KD.ZG/countries>.
- <sup>14</sup> Stephanie Schwartz, "Youth and the 'Arab Spring'," United States Institute of Peace. April 28, 2011. <http://www.usip.org/publications/youth-and-the-arab-spring>.
- <sup>15</sup> "The World Factbook: Yemen," Central Intelligence Agency. June 07, 2016. <https://www.cia.gov/library/publications/the-world-factbook/geos/ym.html>.
- <sup>16</sup> World Bank, "Unemployment, total," <http://data.worldbank.org/indicator/SL.UEM.TOTL.ZS/countries>.
- <sup>17</sup> Gerhard Lichtenthaeler, "Water Conflict and Cooperation in Yemen," 30-35.
- <sup>18</sup> Adam Hafeez, "How Yemen Chewed Itself Dry," Foreign Affairs. July 23, 2013. <https://www.foreignaffairs.com/articles/yemen/2013-07-23/how-yemen-chewed-itself-dry>.
- <sup>19</sup> Carl-friedrich Schlessner, Jonathan F Donges, Reik V Donner, and Hans Joachim, "Armed-Conflict Risks Enhanced by Climate-Related Disasters in Ethnically Fractionalized Countries," Proceedings of the National Academy of Sciences of the United States of America (2016): 1-6.
- <sup>20</sup> "Yemen Crisis: Who is Fighting Whom?" BBC. March 26, 2015. <http://www.bbc.com/news/world-middle-east-29319423>.
- <sup>21</sup> Emily B. Hager and Mark Mazzetti, "Emirates Secretly Sends Colombian Mercenaries to Yemen Fight," New York Times. November 25, 2015. [http://www.nytimes.com/2015/11/26/world/middleeast/emirates-secretly-sends-colombian-mercenaries-to-fight-in-yemen.html?\\_r=0](http://www.nytimes.com/2015/11/26/world/middleeast/emirates-secretly-sends-colombian-mercenaries-to-fight-in-yemen.html?_r=0)
- <sup>22</sup> Christopher Ward, "Water Conflict in Yemen: The Case for Strengthening Local Resolution Mechanisms," in *Water in the Arab World: Management Perspectives and Innovations*, ed. N. Vijay Jagannathan et al. (Washington D.C.: World Bank, 2009), 233-268.
- <sup>23</sup> Gerhardt Lichtenthaler, "A Political Ecology of Water: Factors and Perceptions Influencing Groundwater in the Sa'adah Basin," (London: SOAS, 1997).
- <sup>24</sup> Christopher Ward, "Water Conflict in Yemen: The Case for Strengthening Local Resolution Mechanisms," in *Water in the Arab World: Management Perspectives and Innovations*, ed. N. Vijay Jagannathan et al. (Washington D.C.: World Bank, 2009), 233-268.
- <sup>25</sup> Christopher Ward, "Water Conflict in Yemen," in *Water in the Arab World: Management Perspectives and Innovations*, 233-268.
- <sup>26</sup> Christopher Ward, "Water Conflict in Yemen," in *Water in the Arab World: Management Perspectives and Innovations*, 233-268.
- <sup>27</sup> Abdul Jabbar Zeyad, "Saudi Coalition, Houthi Rebels Restricting Yemen Aid Access: U.N." Reuters. February 16, 2016. <http://www.reuters.com/article/us-yemen-war-saudi-un-idUSKCN0VP2Q6>.
- <sup>28</sup> "Saudi Jets Target's Yemen Reservoir, Dam," Al-Masdar News. February 08, 2016. <http://www.almasdarnews.com/article/saudi-jets-targets-yemen-reservoir-dam/>
- <sup>29</sup> "Yemen: Houthis Block Vital Goods into Taizz," Human Rights Watch. January 31, 2016. <https://www.hrw.org/news/2016/01/31/yemen-houthis-block-vital-goods-taizz>
- <sup>30</sup> "Two-thirds of People in Conflict-hit Yemen without Clean Water," Oxfam. May 26, 2015. <https://www.oxfam.org/en/pressroom/pressreleases/2015-05-26/two-thirds-people-conflict-hit-yemen-without-clean-water>.
- <sup>31</sup> Ashraf Al-falahi, "Death, Starvation Haunt Southern Yemen," Al-Monitor. February 23, 2016. <http://www.al-monitor.com/pulse/originals/2016/02/yemen-taiz-siege-famine-war-houthis-saudi-emirates.html#>.
- <sup>32</sup> "Yemen 2015 UNHCR Country Operations Profile," UNHCR. <http://www.unhcr.org/pages/49e486ba6.html>.
- <sup>33</sup> Jeremy Hodge, "Water Desalination in Taiz," Yemen Times. January 1, 2015. <http://www.yementimes.com/en/1847/health/4760/Water-desalination-in-Taiz.htm>
- <sup>34</sup> "Water Resources," Royal Embassy of Saudi Arabia. [https://www.saudiembassy.net/about/country-information/agriculture\\_water/Water\\_Resources.aspx](https://www.saudiembassy.net/about/country-information/agriculture_water/Water_Resources.aspx).
- <sup>35</sup> Frederika Whitehead, "Water Scarcity in Yemen: the country's forgotten conflict," The Guardian. April 2, 2015. <http://www.theguardian.com/global-development-professionals-network/2015/apr/02/water-scarcity-yemen-conflict>
- <sup>36</sup> Annalisa Merelli, "To Survive a War, Yemenis Are Turning Fog Into Water," Defense One. February 15, 2016. [http://www.defenseone.com/technology/2016/02/survive-war-yemenis-are-turning-fog-water/125942/?oref=defenseone\\_today\\_nl](http://www.defenseone.com/technology/2016/02/survive-war-yemenis-are-turning-fog-water/125942/?oref=defenseone_today_nl).

- 
- <sup>37</sup> Gerhard Lichtenthaler, "Water Conflict and Cooperation in Yemen," *Middle East Report*, no. 254 (April 1, 2010): 30-35.
- <sup>38</sup> Yemen Ministry of Water and Environment, *National Water Sector Strategy and Investment Program (NWSSIP)*, (2004). <http://faolex.fao.org/docs/pdf/yem147103.pdf>.
- <sup>39</sup> Laura Kasinof, "At Heart of Yemen's Conflicts: water crisis," *Christian Science monitor*. November 5, 2009. <http://www.csmonitor.com/World/Middle-East/2009/1105/p06s13-wome.html>
- <sup>40</sup> "Yemen: UN-mediated Peace Talks Continue, with Consensus on Some Issues," UN News Center. May 14, 2016. <http://www.un.org/apps/news/story.asp?NewsID=53941#.V0Maz5ErI2w>.
- <sup>41</sup> "\$4 Bln 'missing' from Yemen's Central Bank," *Al Arabiya English*, May 17, 2016. [http://english.alarabiya.net/en/News/middle-east/2016/05/17/FM-4-billion-has-disappeared-from-Yemen-s-Central-Bank.html?utm\\_content=buffere203e](http://english.alarabiya.net/en/News/middle-east/2016/05/17/FM-4-billion-has-disappeared-from-Yemen-s-Central-Bank.html?utm_content=buffere203e).
- <sup>42</sup> USAID, "United States Announces Nearly \$139 Million Dollars in Humanitarian Assistance for Yemen," News release, April 6, 2016. <https://www.usaid.gov/news-information/press-releases/apr-6-2016-united-states-announces-nearly-139-million-humanitarian-assistance>.
- <sup>43</sup> USAID, *Water and Conflict*, (Washington D.C.) 20.
- <sup>44</sup> Isabel Kershner, "A Rare Middle East Agreement, on Water," *New York Times*. December 9, 2013. [http://www.nytimes.com/2013/12/10/world/middleeast/israel-jordan-and-palestinians-sign-water-project-deal.html?\\_r=0](http://www.nytimes.com/2013/12/10/world/middleeast/israel-jordan-and-palestinians-sign-water-project-deal.html?_r=0)
- <sup>45</sup> Anders Jägerskog, "Why States Co-operate over Shared Water: The Water Negotiations in the Jordan River Basin," *In Water Resources in the Middle East: Israel-Palestinian Water Issues — From Conflict to Cooperation*, edited by Hillel Shuval and Hassan Dweik, 195-202. Springer, 2007.
- <sup>46</sup> USAID, *Water and Conflict*, (Washington D.C.) 3.
- <sup>47</sup> Kate Diamond, "A Year for Cooperation, Not Conflict, Over Water," *New Security Beat*. February 12, 2013. <https://www.newsecuritybeat.org/2013/02/year-cooperation-conflict-water/>.