



**NAVAL
POSTGRADUATE
SCHOOL**

MONTEREY, CALIFORNIA

THESIS

**SYRIAN REFUGEES: ARE THEY A NON-
TRADITIONAL THREAT TO WATER SUPPLIES IN
LEBANON AND JORDAN?**

by

Stephen J. Klingseis

September 2016

Thesis Advisor:
Second Reader:

Anne M. Baylouny
Naazneen H. Barma

Approved for public release. Distribution is unlimited.

THIS PAGE INTENTIONALLY LEFT BLANK

REPORT DOCUMENTATION PAGE			<i>Form Approved OMB No. 0704-0188</i>
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington, DC 20503.			
1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE September 2016	3. REPORT TYPE AND DATES COVERED Master's thesis	
4. TITLE AND SUBTITLE SYRIAN REFUGEES: ARE THEY A NON-TRADITIONAL THREAT TO WATER SUPPLIES IN LEBANON AND JORDAN?		5. FUNDING NUMBERS	
6. AUTHOR(S) Stephen J. Klingseis			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey, CA 93943-5000		8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING /MONITORING AGENCY NAME(S) AND ADDRESS(ES) N/A		10. SPONSORING / MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government. IRB protocol number ____N/A____.			
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release. Distribution is unlimited.		12b. DISTRIBUTION CODE	
13. ABSTRACT (maximum 200 words) Water scarcity is a critical problem facing the Middle East, more so than any other region of the world. Countries in the area have devoted vast amounts of resources to coping with the decreasing availability of water. Methods from cloud seeding to underground pipelines of desalinated water from the sea are prevalent in government discussions on the issue. These projects have had marginal impacts due to the massive humanitarian crisis caused by the Syrian civil war. With Syrians migrating to other Middle Eastern countries by the millions, the water-stressed states of the region cannot cope with the additional demand on their fragile and failing hydrological systems. This thesis examines Lebanon and Jordan as comparative case studies to explore the effects of Syrian refugees on the water supplies of each country as a non-traditional security threat. Political stability is the ultimate goal of each state; however, the effects of millions of refugees on available water has a significant impact on civil society and the perceptions of the host populations, which may undermine the desired goal of stability for each regime.			
14. SUBJECT TERMS water, refugee, non-traditional, Jordan, Lebanon, infrastructure, state capacity, Syrian refugees		15. NUMBER OF PAGES 77	
		16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT UU

THIS PAGE INTENTIONALLY LEFT BLANK

Approved for public release. Distribution is unlimited.

**SYRIAN REFUGEES: ARE THEY A NON-TRADITIONAL THREAT TO
WATER SUPPLIES IN LEBANON AND JORDAN?**

Stephen J. Klingseis
Lieutenant, United States Navy
B.A., James Madison University, 2008

Submitted in partial fulfillment of the
requirements for the degree of

**MASTER OF ARTS IN SECURITY STUDIES
(MIDDLE EAST, SOUTH ASIA, SUB-SAHARAN AFRICA)**
from the

**NAVAL POSTGRADUATE SCHOOL
September 2016**

Approved by: Anne M. Baylouny
Thesis Advisor

Naazneen H. Barma
Second Reader

Mohammed M. Hafez
Chair, Department of National Security Affairs

THIS PAGE INTENTIONALLY LEFT BLANK

ABSTRACT

Water scarcity is a critical problem facing the Middle East, more so than any other region of the world. Countries in the area have devoted vast amounts of resources to coping with the decreasing availability of water. Methods from cloud seeding to underground pipelines of desalinated water from the sea are prevalent in government discussions on the issue. These projects have had marginal impacts due to the massive humanitarian crisis caused by the Syrian civil war. With Syrians migrating to other Middle Eastern countries by the millions, the water-stressed states of the region cannot cope with the additional demand on their fragile and failing hydrological systems.

This thesis examines Lebanon and Jordan as comparative case studies to explore the effects of Syrian refugees on the water supplies of each country as a non-traditional security threat. Political stability is the ultimate goal of each state; however, the effects of millions of refugees on available water has a significant impact on civil society and the perceptions of the host populations, which may undermine the desired goal of stability for each regime.

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

I.	INTRODUCTION.....	1
A.	BACKGROUND	1
B.	LITERATURE REVIEW	2
1.	Environmental Factors and State Responses	2
2.	Significance to the State and Potential Threats	5
3.	Water and Refugees in Lebanon	8
4.	Water and Refugees in Jordan	9
5.	Potential Explanations and Outcomes	11
6.	Research Design	14
II.	WATER SECURITY AND GOVERNANCE	15
A.	LEBANON.....	15
B.	JORDAN.....	20
C.	SUMMARY	27
III.	LEBANON’S WATER AND THE REFUGEES	29
IV.	JORDAN’S WATER AND THE REFUGEES	41
V.	CONCLUSION	53
	LIST OF REFERENCES.....	59
	INITIAL DISTRIBUTION LIST	65

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF ACRONYMS AND ABBREVIATIONS

MWI	Ministry of Water and Irrigation
NGO	non-governmental organization
OECD	Organization for Economic Co-operation and Development
PFI	private finance initiative
PPP	public private partnership
UNECE	United Nations Economic Council for Europe
UNHCR	United Nations High Commissioner for Refugees
WAJ	Water Authority of Jordan
WASH	water, sanitation, and hygiene

THIS PAGE INTENTIONALLY LEFT BLANK

I. INTRODUCTION

A. BACKGROUND

The issue of water in the Middle East has been the subject of much study and debate in recent years. As the most water-poor region in the world, it suffers from less consistent rainfall and the least amount of available groundwater than any other area on the planet.¹ Despite the apparent lack of resources, the region has continued to show economic expansion and population growth. This growth has largely resulted from the over exploitation of resources, inefficient policies, and poor water usage practices, which are all magnified by the sudden influx of Syrian refugees into Middle Eastern water stressed states. Thus, the availability of water has rapidly become a significant non-traditional threat in Jordan and Lebanon because they are the most demographically burdened states hosting refugees.

The conflict in Syria has created one of the worst humanitarian disasters in recent history. According to the Mercy Corps, more than 11,000,000 people have been displaced as a result of the violence started in 2011.² Of those 11,000,000 Syrians, an estimated 2,000,000 have been absorbed by Lebanon and Jordan, and this has placed immeasurable strain on the ability of the states to provide water to refugees and citizens alike.³ Though recognizing the daunting task Lebanon and Jordan face to provide for massive numbers of Syrian refugees, effective water management policy still eludes those states and inefficient water usage practices remain the status quo.

The inability of Lebanon and Jordan to address water scarcity and the impact of the Syrian refugees on their resources pose a significant threat to the legitimacy and stability of states and the greater region. The opportunity for private actors to replace the state in facilitating the basic needs of citizens, often for great personal profit, has the

¹ Growing Blue, “The Growing Blue Tool,” accessed October 12, 2015, <http://growingblue.com/the-growing-blue-tool/>.

² Mercy Corps, “Quick Facts: What You Need to Know about the Syria Crisis,” September 2, 2015, <https://www.mercycorps.org/articles/iraq-jordan-lebanon-syria-turkey/quick-facts-what-you-need-know-about-syria-crisis>.

³ Ibid.

potential to turn to dissatisfaction with the government and political unrest. Addressing this issue responsibly will secure water for the people residing in Lebanon and Jordan and avoid a potentially disastrous non-traditional security threat. Non-traditional security threats are defined as those threats to national security that do not stem from a military or interstate competition or balance of power, often long-term in consequences, difficult to reverse, and transnational.⁴ Examples include scarcity of resources, the spread of infectious disease, transnational crime, ethnic conflict, and environmental degradation.

B. LITERATURE REVIEW

This literature review focuses on water scarcity in the Middle East and the potential impact that Syrian refugees are having on neighboring Jordan and Lebanon, particularly as a non-traditional security threat. First, the review underscores the nature of the water shortage throughout the entire region by examining the environmental causes of the expanding crisis. Next, literature on international and domestic structures impacting the water crisis are examined. Furthermore, the influx of Syrian refugees into Lebanon and Jordan is addressed in light of the potential threats to the state regarding water. Finally, the linkages between the effects of refugees on water availability as a non-traditional security threat is the basis for the remainder of the thesis.

1. Environmental Factors and State Responses

The uncertainty of data is a key problem when analyzing literature regarding the availability of water throughout the Middle East. The lack of accurate and consistent data may be due to several different reasons. For instance, accounting for water in the region is a highly politicized endeavor resulting in divergent views and a lack of consensus on usage and availability numbers reported by states and organizations. This is particularly evident in reports made by upstream and downstream riparian states when lobbying to undertake projects on shared water resources. States wish to present the data in such a way that allows them to draw the most on available resources, which precipitates over

⁴ Yizhou Wang, *Defining Non-traditional Security and Its Implications for China* (Beijing: Institute of World Economics and Politics, Chinese Academy of Social Sciences, 2004), <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.472.3779&rep=rep1&type=pdf>.

reporting of neighborly usage while underreporting domestic withdrawal of shared resources. Also, there is a lack of consistent historical data since studying the hydrography of the region is a relatively new priority. This is largely a result of underfunding and a lack of political interest to determine the severity of the water crisis.⁵ Despite this uncertainty, generalizations can be drawn regardless of the inconsistencies in reporting.

The Middle East suffers from some of the most unpredictable and scarce rainfall as well as being home to some of the most arid regions in the world.⁶ Every country in the region, aside from Iran, Iraq, and Turkey, falls below the water scarcity threshold of 1000m³/person/year as established by the United Nations (UN).⁷ Since water is so scarce throughout the region, Middle Easterners, particularly in Jordan because of decades old water rationing practices, are some of the most frugal water users in the world.⁸ However, the frugality of the people will not be enough to compensate for the rapid population growth, which is projected to double in size in the next 25 years.⁹ This population growth will put an increased strain on the available water resources and will make it exceedingly difficult for states in the region to cope. States will need to ensure their water supply to feed their burgeoning populations and expand their economies. As it becomes clearer that the hydrological system cannot meet the demands of population growth, riparian disputes and internal politics will play a major role in the development of a long-term sustainable solution to provide water to the people of the Middle East.¹⁰

⁵ Greg Shapland, *Rivers of Discord* (New York: St. Martin's Press, 1997), 4.

⁶ Peter Rogers and Peter Lydon, "Preface," in *Water in the Arab World: Perspectives and Prognoses*, ed. Peter Rogers and Peter Lydon (Cambridge, MA: The Division of Applied Sciences, Harvard University, 1994), vii.

⁷ Afreen Siddiqi and Laura Diaz Anadon, "The Water-Energy Nexus in Middle East and North Africa," *Energy Policy* 39, no. 8 (2011): 4532, <http://www.sciencedirect.com/science/article/pii/S0301421511003065>.

⁸ Mercy Corps, *Tapped Out: Water Scarcity and Refugee Pressures in Jordan* (Portland, OR: Mercy Corps, 2014), <https://www.mercycorps.org/research-resources/tapped-out-water-scarcity-and-refugee-pressures-jordan>, 4.

⁹ Shapland, *Rivers of Discord*, 3.

¹⁰ John A. Allan and Tony Allan, *The Middle East Water Question: Hydropolitics and the Global Economy* (London: I. B. Tauris & Co Ltd, 2001), 10.

To combat the shortage of water caused by nature, many countries in the region have devoted large amounts of money to harnessing available resources. Unfortunately, what water is available is becoming more difficult to extract.¹¹ The three predominant methods that have been used to increase the availability of water are damming surface water, pumping groundwater reserves, and desalinating seawater.¹² Surface water includes rivers and lakes that are recharged through seasonal rainfall, while groundwater consists of underground aquifers that slowly recharge over time with consistent precipitation.¹³

These projects, though designed to alleviate water shortages, rarely have a meaningful impact on the well-being of the population for several reasons. Greg Shapland argues that dams can take more than a decade to make any significant contribution to the water supply of a state and are often the subject of lengthy negotiations between all riparian states, further delaying projects and desired outputs.¹⁴ Pumping groundwater can often lead to border disputes between states that rely on the same aquifers for sustenance. Furthermore, the cost of desalination is prohibitive to many countries because of their distance from seawater, which significantly decreases the viability of this technology to help the majority of water-poor countries in the Middle East.¹⁵

In addition to fierce competition for existing potable water supplies, states are facing a marked decrease in the quality of available water, further exacerbating the scarcity of water and the ability of states to provide fresh water to their constituents. As expected, it is the most water-poor states that are facing the greatest challenge from the rapidly decreasing water quality. Several countries in the Middle East, including Syria, Jordan, and Israel, are facing severe degradations in the quality of water they are able to

¹¹ Abdul-Karim Sadik and Shawki Barghouti, "Water Problems of the Arab World: Management of Scarce Resources," in *Water in the Arab World: Perspectives and Prognoses*, eds. Peter Rogers and Peter Lydon (Cambridge, MA: The Division of Applied Sciences, Harvard University, 1994), 1.

¹² Shapland, *Rivers of Discord*, 3.

¹³ *Ibid.*

¹⁴ *Ibid.*

¹⁵ *Ibid.*, 3, 12.

extract from groundwater sources. Traditionally, Lebanon has been viewed as a water rich state, but inefficient water management and infrastructure, combined with population increases, including refugees, makes Lebanon a water-poor state, as well. Some see this as the direct result of over exploitation of groundwater reserves in conjunction with seawater and brine intrusion into groundwater aquifers. As the total amount of available water decreases, contaminants become increasingly concentrated in the remaining freshwater, making this a persistent and growing problem for states to overcome.¹⁶

2. Significance to the State and Potential Threats

Literature regarding water as a resource to the state and its possible security implications generally separates possible threats into two categories: international and domestic threats. John A. Allan suggests that conflicts between states have occurred in the past that have resulted in large amounts of natural water supplies changing hands; however, in today's international political climate, cooperation is much more profitable for riparian states, which are those that border sources of groundwater.¹⁷ The most recent example of this is Israel pursuing increased desalinization to manufacture water simply because it is easier to make and sell water when compared to lengthy negotiations with other states, often Jordan.¹⁸ International competition will continue primarily through political posturing; however, states' international water policies will actually support cooperation.¹⁹ The literature suggests domestic interests regarding water allocation will breed internal competition and increase the chances of conflict within state borders.²⁰

To comprehend the water shortage issue in the Middle East, several factors at the international level require critical examination. Almost all states in the region share

¹⁶ Avner Vengosh and Eliahu Rosenthal, "Saline Groundwater in Israel: Its Bearing on the Water Crisis in the Country," *Journal of Hydrology* 156, no. 1 (1994): 393, <http://www.sciencedirect.com/science/article/pii/0022169494900876>.

¹⁷ John A. Allan, "Hydro-peace in the Middle East: Why No Water Wars?: A Case Study of the Jordan River Basin," *SAIS Review* 22, no. 2 (2002): 257, https://muse.jhu.edu/journals/sais_review/v022/22.2allan.html.

¹⁸ *Ibid.*, 269.

¹⁹ Allan, "Hydro-peace in the Middle East," 255.

²⁰ Shapland, *Rivers of Discord*, 3.

groundwater sources in some fashion, and they are also equally exposed to the effects of over extraction and contamination.²¹ This alone transforms aspirations for water security by one state into an international matter that can have far-reaching consequences for other states. Due to this connection between riparian states, Joyce Starr writes, “Water security will soon rank with military security in the war rooms of defense ministries.”²² Yet, despite the increasing emphasis placed on securing water by Middle Eastern states in recent decades, a major conflict has not broken out yet as a direct result of water security, primarily because of international structures.

A prominent structure that supports riparian cooperation, suggested by J. A. Allan, is the global food trade because it allows water-poor states the opportunity to continue their inefficient strategies for water usage. It is through the structure of a global economy that states with little or no renewable water are able to maintain the façade of meeting their water requirements while exposing themselves to minimal political risk. Furthermore, Allan argues that many policies implemented between states are created on biased views that deliberately skew the facts, yet allow for agreements to be reached simply to gain political favor and to provide sound bites for domestic consumption. It is precisely this effort to maintain domestic favor by not disrupting the current system that prevents serious reform in water usage and sharing at the international level.²³

Another factor that contributes to maintaining the status quo on the international level, despite the known shortage of water resources, is deliberate ambiguity in water agreements.²⁴ Itay Fischhendler points out several instances throughout the world, from the Ganges River in India to the Jordan River Valley, where treaties have been signed that do not make any substantial progress toward more equitable sharing of resources, but are vague to the point that each riparian can deliver a victory to its domestic audience.²⁵ Fischhendler asserts the causes of ambiguity regarding water are “non-excludability,

²¹ Joyce R. Starr, “Water Wars,” *Foreign Policy*, no. 82 (Spring 1991): 19, doi: 10.2307/1148639.

²² *Ibid.*

²³ Allan, “Hydro-peace in the Middle East,” 257–258.

²⁴ Itay Fischhendler, “Ambiguity in Transboundary Environmental Dispute Resolution: The Israeli—Jordanian Water Agreement,” *Journal of Peace Research* 45, no. 1 (2008): 92.

²⁵ *Ibid.*, 93.

rivalry, trans-boundary factors, and the erratic nature of the availability and demand of the resource.”²⁶ It is clear to see that all of Fischhendler’s causes for ambiguity hint at riparian states having a lack of political will to tackle the issue at the international level. These assertions, in line with those of J. A. Allen, support the norm of cooperation between states that share water resources despite no significant progress addressing the crisis of managing the supply and demand of water.

Water, to a large extent, is the foundation of economic prosperity, and thus, its decreasing availability represents a significant problem for the Middle Eastern states.²⁷ Governments in the Middle East are very aware of the importance of water for economic and social development, but competing domestic interests are a crucial factor in determining how available water is obtained and eventually allocated. Powerful agriculture lobbies have done a lot of work in securing their usage of water and have become the largest freshwater consumers in water stressed countries in the Middle East.²⁸ This majority usage is due to two main reasons: the significant impact of agriculture on local economies through employment, and states attempting to reach a level of food security by growing food domestically.²⁹

The dominance of the agricultural sector in the usage of water presents several challenges for states to overcome. As economic development continues within water-poor states, municipal usage is expected to increase with the demands for a higher quality of life. More demand on the inadequate water delivery infrastructure coupled with stagnant or decreasing supply represents a risk to the states. Domestic competition for water resources has the potential to cause dissatisfaction between civil society and the political elites with interests in the agricultural sector.³⁰

²⁶ Ibid., 104.

²⁷ Rogers and Lydon, “Preface;” May A. Massoud et al., “The Challenges of Sustainable Access to Safe Drinking Water in Rural Areas of Developing Countries: Case of Zawtar El-Charkieh, Southern Lebanon,” *Journal of Environmental Health* 72 (10): 24.

²⁸ Allan, “Hydro-peace in the Middle East,” 257.

²⁹ Shapland, *Rivers of Discord*, 3.

³⁰ Amanda Silverman, “Global Thinkers: Why Water Is a Fundamental National Security Issue,” *Global Thinkers, Foreign Policy Online*, November 3, 2015, <http://foreignpolicy.com/2015/11/03/global-thinkers-why-water-is-a-fundamental-national-security-issue/>.

Another domestic issue that the literature acknowledges is the inadequacy of water delivery infrastructure and the possible implications that accompany the failure of the state to meet basic needs. In many cases, particularly in Jordan, Lebanon, and Israel, when water is delivered by state-run infrastructure, the supply is intermittent when available or undrinkable because of contamination or salinization.³¹ This is reflected in the region having the highest costs of water availability per capita in the world, dating back to 1985.³² The high cost per capita is a direct result of private enterprise taking the place of the state in delivering basic goods, and this has the potential for increasing delegitimization of the state and state-run services.

3. Water and Refugees in Lebanon

The issues regarding water quality and availability in Lebanon have begun to take on a new level of significance given the Syrian refugee crisis. As more attention is given to the plight of the refugees, the standard rhetoric of the Lebanese government claiming a surplus of water resources has started to come under more scrutiny in both academia and the media. New reports and articles have begun to surface that directly contradict statements made by the government regarding the quality and availability of water to citizens and refugees alike.³³

Recent claims have been made by the Lebanese government suggesting that in the near future Lebanon would be experiencing a water surplus of some 500 million cubic meters, but these estimates do not take into account many important factors that drastically reduce the amount of water that is actually available in the state.³⁴ It is estimated that human actions have decreased the availability of water from some sources by as much as 29 percent, as can be seen in increasing desertification throughout the

³¹ Vengosh and Rosenthal, *Saline Groundwater in Israel*, 389;

T. Darwish et al., "Salinity Evolution and Crop Response to Secondary Soil Salinity in Two Agro-climatic Zones in Lebanon," *Agricultural Water Management* 78, no. 1 (2005): 152, <http://www.sciencedirect.com/science/article/pii/S0378377405002337152>.

³² Starr, "Water Wars," 18.

³³ Kamel Saleh, "Lebanon Faces Water Crisis," *Al-Monitor*, March 30, 2014, <http://www.al-monitor.com/pulse/security/2014/03/lebanon-water-poverty-line-crisis.html#>.

³⁴ *Ibid.*

country.³⁵ Furthermore, as the growing population continues to draw on a resource with a finite supply, the amount of water that is available per individual will continue to decrease. Additionally, water wastage, pollution, evaporation, and drought all negatively impact reliable water delivery to the populace.³⁶ All of these factors combined with unreliable seasonal rainfall suggest Lebanon is facing a water shortage that state resources cannot offset.

Shortcomings with the water quality and availability are not only the effect of a growing Lebanese population but are also exacerbated by the 1,100,000 Syrian refugees who have fled civil war by migrating to Lebanon.³⁷ The quality of water in areas with large numbers of new refugees has declined to the point of being referred to as “hell water” to the detriment of refugees and citizens alike.³⁸ Poor water management practices and significantly increased demand expedite the loss of the availability of quality drinking water, leading most refugees to live on two gallons of clean water a day indefinitely, which must be shipped in by outside providers.³⁹

It is reasonable to expect that the increased stress placed upon water resources along with declining quality and availability have the potential to destabilize the central government of Lebanon. With ever-increasing numbers of refugees flowing over the border, the state’s ability to provide basic goods to its citizens and those seeking refuge will continue to deteriorate. This in turn will increase the chances for strife and destabilization in communities throughout Lebanon.

4. Water and Refugees in Jordan

As they have to Lebanon, Syrian refugees have also fled to Jordan to seek safety from the brutal conflict that has engulfed their state. An estimated 600,000 Syrians have

³⁵ Amin Shaban, “Indicators and Aspects of Hydrological Drought in Lebanon,” *Water Resources Management* 23, no. 10 (2009): 1875–1876.

³⁶ Saleh, “Lebanon Faces Water Crisis.”

³⁷ Mercy Corps, “Quick Facts.”

³⁸ Peter Schwartzstein, “Syrian Refugees in Lebanon Camp Reliant on ‘Hell Water’ that Reduces Metal to Rust,” *The Guardian*, May 26, 2015, <http://www.theguardian.com/global-development/2015/may/26/syrian-refugees-lebanon-shatila-camp-hell-water>.

³⁹ Ibid.

already crossed the border into Jordan, and that number is expected to surpass 1,000,000 by the end of year 2016.⁴⁰ Unlike Lebanon, however, Jordan is widely known as one of the most water-poor countries in the Middle East with the ability to provide only 145 cubic meters of water per person annually, substantially less than the water scarcity annual threshold of 500 cubic meters per person annually as established by the UN.⁴¹

To cope with the numbers of refugees, Jordan has received substantial international aid to absorb the shock on resources because large camps have been constructed to house refugees and provide for their basic needs, including water availability.⁴² As the state has found, camps and international aid have not been enough to offset the impact of the refugees on Jordan's water supply. Many towns near refugee camps are forced to go without water for days on end, resulting in a roughly 50 percent decrease in the water that is made available to those Jordanian citizens.⁴³

The decrease in water that is allocated to Jordanian citizens has led the media to criticize how the government has handled the allocation of resources to deal with the Syrian refugees. For instance, the *Daily Star* reports the refugees are squandering water by continuing to consume at the levels they would have if they were still in Syria, which possesses significantly more renewable natural water than Jordan.⁴⁴ General negativity toward refugees is compounded because of the perception that refugees inhibit Jordanians ability to access education, jobs, and even private housing.⁴⁵ Increased discrimination

⁴⁰ Mercy Corps, "Quick Facts."

⁴¹ Caroline Gluck, "Syrian Refugee Influx Adding to Jordan's Water Worries," OXFAM Canada, accessed October 12, 2015, <http://www.oxfam.ca/blogs/conflict-emergencies/refugee-influx-adding-to-jordans-water-worries>.

⁴² Mercy Corps, "Quick Facts."

⁴³ Gluck, "Syrian Refugee Influx."

⁴⁴ Ahmad Khatib, "Syrian Refugees Draining Water-poor Jordan Dry," *The Daily Star*, June 1, 2012, <http://www.dailystar.com.lb/News/Middle-East/2012/Jun-01/175355-syrian-refugees-draining-water-poor-jordan-dry.ashx>; Farzaneh Roudi-Fahimi, Liz Creel, and Roger-Mark De Souza, "Finding the Balance: Population and Water Scarcity in the Middle East and North Africa," Population Reference Bureau, accessed July 23, 2016, <http://www.prb.org/Publications/Reports/2002/FindingtheBalancePopulationandWaterScarcityintheMiddleEastandNorthAfrica.aspx>.

⁴⁵ Soazic Heslot, "Jordan's Food and Water Security," Future Directions International, September 11, 2014, <http://www.futuredirections.org.au/publications/food-and-water-crises/1939-jordan-s-food-and-water-security.html>.

against Syrians sets the stage for political instability because the Syrians represent an increasing portion of the population, if proactive measure are not taken to rectify the perception of Jordanians. Unfortunately for Jordan, refugees already account more than 10 percent of the population, and that number is only expected to grow as the conflict in Syria continues.⁴⁶

The Global Food and Water Crisis Research Programme cites increased domestic competition for housing, food security, and water as a major problem faced by the Jordanian government.⁴⁷ Only by addressing the allocation of water, the efficiency of the infrastructure, and the water usage of citizens will Jordan be able to avoid future instability. Furthermore, unlike the Lebanese, Jordanian citizens expect their government to cater to their needs and effectively use international aid not only for refugees but also for the improvement of state-run infrastructure.⁴⁸ Jordan's ability to use aid to meet these widely varying needs will determine how politically stable the state can remain in the face of a severe resource shortage.

5. Potential Explanations and Outcomes

The literature review outlines many factors that have contributed to the water crisis in Lebanon and Jordan; however, the impact of the Syrian refugees as a non-traditional security threat leads to several expectations that connect these factors. Similar observations can be made about both states, but it is highly likely that they will experience different scenarios.

Lebanon faces serious challenges in dealing with Syrian refugees who are expediting the drain on natural resources. The lack of a state response to help the Lebanese populace cope with over 1,000,000 refugees could have a tremendous impact on the legitimacy of the state, which is already low. Furthermore, if people experience the effect of the water shortfall and the state cannot provide an adequate or timely solution,

⁴⁶ Ibid.

⁴⁷ Ibid.

⁴⁸ Mercy Corps, Tapped Out, ""30.

popular dissatisfaction could run rampant. The state's best interest is to ensure its citizens are content while attempting to meet the needs of the refugees.

The Lebanese government has limited ability to intervene, as evident by a lack of state-sponsored camps or institutions for the refugees; therefore, international aid is not as abundant as in Jordan. If Lebanon were able to take advantage of aid that accompanies refugee camps, it would stand to gain desperately needed resources, yet that outcome is unlikely due to its historical relationship with Palestinian refugees. Furthermore, Lebanon could extend the influence and reach of its central government because it would have to ensure the security of the refugees, most likely through sustained military presence in areas housing refugees.⁴⁹ However, it is unlikely that this scenario will become reality because of the weakness of the state. Without international aid, Lebanon faces greater security challenges because it is unable to secure its borders, implement effective policy toward arriving refugees, and create a plan to address water availability.

On the other hand, non-state actors in Lebanon could step in with the solutions necessary to provide water for citizens and refugees. Private water deliveries are common in the region, but with increased stress on available resources, they have become less frequent and more expensive.⁵⁰ The balance between availability and price must be found and kept in check to prevent societal discord. In the event that this is achievable, the Lebanese government could avoid a destabilizing situation and maintain the status quo of having an unobtrusive role in the daily lives of its constituents.

Jordan faces different challenges in mitigating the threat of Syrian refugees to its dwindling water supply. A strong response from the state has helped to curb much popular unrest regarding the large influx of refugees. In contrast to Lebanon, Jordan has received significant international aid to deal with refugees, mainly due to the construction of camps. The state has established and secured refugee camps and closely monitors its borders with Syria to track effectively the numbers of refugees entering the country. Not

⁴⁹ Karen Jacobsen, "Can Refugees Benefit the State? Refugee Resources and African Statebuilding," *Journal of Modern African Studies* 40, no. 4 (2002): 590.

⁵⁰ OXFAM, "Approaching Summer and Syrian Refugee Influx add to Jordan's Water Worries," March 22, 2013, <http://www.oxfam.org.uk/media-centre/press-releases/2013/03/syria-refugee-water-worries>.

only does this reinforce the role of the state in addressing the refugee crisis, but it also increases its own legitimacy due to its active role in promoting the interests of its citizens.

Jordan has also used the plight of the refugees to call attention to its water problems and has done much to gain international attention for this pressing issue. Essentially, the state has injected itself into the refugee crisis, and it can increase its security and legitimacy by using the refugees and the resources tied to them in a way that appeal to the populace and address their concerns on water usage. Despite the significant amounts of aid given to Jordan and intervention by the state, commentary blaming Syrian refugees for problems within the country is common.

The threat for Jordan is managing the perception of the Jordanian population toward the refugees. If the Jordanian people believe that the influx of refugees is negatively affecting the basic goods provided by the state, popular discord may follow. There are indications that this is starting to take place and that discrimination is becoming more commonplace. Also, news sources have alleged that Syrians have found it more difficult to cross the Jordanian border to seek refuge in camps.⁵¹ These actions may appease Jordanians but are unsustainable if the state wishes to continue receiving large amounts of international support.

As the various causal expectations indicate, it is not that the influx of refugees flooding into neighboring states represents in itself a security threat, but it is the state's response to the evolving situation that will determine future security. Lebanon will have much difficulty providing basic services to refugees and citizens; paradoxically, refugees do not pose much threat because expectations for state intervention are already low and non-state actors have set the precedent of stepping in where the state is unable to provide. In contrast to Lebanon, Jordan is significantly robust, but it faces increased threats from refugees because of its role in the region as a critical U.S. ally. The slightest hint of political instability could send shockwaves through the region and drastically alter U.S. foreign policy in the Middle East. Though the stakes are high in both cases, the

⁵¹ Rana F. Sweis, "No Syrians Are Allowed into Jordan, Agencies Say," *The New York Times*, October 8, 2014, <https://www.google.com/search?client=safari&rls=en&q=Syrian+refugees+turned+away+from+Jordan&ie=UTF-8&oe=UTF-8#q=Syrian+refugees+turned+away+from+Jordan&start=10>.

consequences of instability in Jordan are steep because of its close relationship with the U.S. and its current role as one of the only stable and reliable U.S. allies the region.

6. Research Design

The research design is of two comparative case studies, Lebanon and Jordan. These two cases are particularly significant because they represent two states that are very different in nature, yet are in a similar situation regarding water scarcity and Syrian refugees. Furthermore, the security implications the refugees impose on each state's water resources differ due to the vast difference between state institutions, yet they are equally important for regional security.

Also for this thesis, Evidence pertaining to water availability in Lebanon and Jordan is evaluated to determine the overall impact of Syrian refugees on available resources. Additionally, a study of policies regarding water usage, treatment, infrastructure, and projects is included to evaluate the effectiveness of both states to adapt to the changing resource requirements imposed by citizens and refugees. This provides the first glimpse into the possible hypotheses regarding state reactions and implications for each state's citizens.

Next, to measure the level of popular satisfaction with the state's handling of the refugees and their impact on available resources, popular opinion is surveyed through journalistic sources. As would be expected, growing civil discontent is often accompanied by heavy media coverage, though some repression of media reporting should be expected given the regional climate toward dissenting voices. Additionally, the plight of the refugees is garnering significant international media attention, and that is the richest avenue to investigate water data. The implications revealed by journalistic reporting provide a valuable indication as to the effectiveness of the states' ability to manage the growing concerns of citizens regarding water and refugees.

II. WATER SECURITY AND GOVERNANCE

Water governance and security are two crucial elements when analyzing any water related issue in the Middle East. Historically, both Lebanon and Jordan have had very little government oversight in the water sector, and this has contributed to the crisis they face today. Modern political and economic pressures have led to more efforts in providing greater efficiency of services to water users, usually through privatization. Both Lebanon and Jordan have faced significant challenges to making the water sector profitable and capable of providing adequate services to constituents. Further complicating the generation of more water resources for Lebanon and Jordan are the regional implications of all development projects aimed at improving water security. Contentious relationships with Israel have precluded equitable resource sharing in the region and have inflamed the water shortages in both countries. Examining water governance and water security will establish the analytical framework against which the impact of the Syrian refugees can be assessed as a non-traditional security threat.

A. LEBANON

Lebanon has made great strides to modernize its methods of governing and managing water, but reform efforts suffer from many confusing laws and the many different organizations often duplicate projects because of a lack of coordination. The foundations for the current laws are recent, dating from the year 2000 with the passage of Law 221.⁵² After several amendments and corrections, the fundamental principle of the law is “to separate clearly between the macro and micro management of water, and to strengthen the policy of the decentralization by granting more autonomy to regional authorities involved by day to day [sic] management of the water supply.”⁵³ A significant aspect of the reform effort is that changes in the management of resources are encouraged by the state, but private interests acting within local communities lead the efforts. This

⁵² Selim Catafago, “Restructuring Water Sector in Lebanon: Litani River Authority-Facing the Challenges of Good Water Governance,” in *Food Security under Water Scarcity in Méditerranéennes: Série A. Séminaires Méditerranéens*, ed. Rosella Monti (Paris: CIHEAM, 2005), <https://om.ciheam.org/om/pdf/a65/05002197.pdf>, 75.

⁵³ Ibid.

approach fosters an environment conducive to investment and innovation, but it allows for many of the pitfalls common in Lebanon's private sector.

Public private partnerships (PPPs) are frequently seen as the best way to modernize the governance and management of water resources in Lebanon.⁵⁴ The United Nations Council for Europe (UNECE) states, "Once rare and limited, these public-private partnerships (PPPs) have emerged as an important tool for improving economic competitiveness and infrastructure services."⁵⁵ PPPs have gained popularity throughout the world because they represent a collaborative effort between the state and private sector in an institutionalized form that is used to bring a public good to the populace.⁵⁶ This approach is attractive to Lebanon because it is designed to balance returns to shareholders with the delivery of a public good, in this case water.⁵⁷ Despite the appeal to the Lebanese government for private entities to bear the burden of providing a public good to the people, many issues have prevented PPPs from being effective in Lebanon. Ghina Yamout and Dima Jamali identify several key problems regarding this strategy including the lack of collections for services provided and strong resistance to any rise in water fees.⁵⁸ These factors make it exceedingly difficult for a private company or investor to make a profit, thus undermining the proposed role of a PPP in Lebanon.

Even massive amounts of public spending have been inadequate to spur reform in water governance. Prior to the passage of Law 221, excessive public spending led to ineffective and redundant mechanisms for managing the delivery of water. From 1951 through 1995, 22 autonomous authorities were established with roughly 220 commissions and projects tasked with managing the distribution of water to the population and for

⁵⁴ Ghina Yamout and Dima Jamali, "A Critical Assessment of a Proposed Public Private Partnership (PPP) for the Management of Water Services in Lebanon," *Water Resources Management* 21, no. 3 (2007): 611, <http://link.springer.com/article/10.1007/s11269-006-9033-3>.

⁵⁵ United Nations Economic Commission for Europe [UNECE], *Guidebook on Promoting Good Governance in Public-Private Partnerships* (Geneva: United Nations, 2008), <http://www.unece.org/fileadmin/DAM/ceci/publications/ppp.pdf>, vii.

⁵⁶ *Ibid.*, 613.

⁵⁷ *Ibid.*, 612.

⁵⁸ *Ibid.*, 616.

irrigation purposes.⁵⁹ Autonomous authorities are legally tasked with operating hydraulic or electric projects under the guidance of the Ministry of Hydraulic and Electric Resources.⁶⁰ Though recent reforms have done much to curb the excesses, particularly reducing the number of autonomous authorities to four, restructuring water governance with minimal government oversight has been a slow process.

One of the reasons for the slow pace of reform in Lebanon is that a majority of the infrastructure modernization projects rely on funding from private donors. Reliance on private donors is common with PPPs; however, alternative fundraising methods such as the private finance initiative (PFI) use government resources to pay for infrastructure projects, which are then turned over to private companies to assume the risk of investment from the state.⁶¹ Furthermore, the Lebanese government does not have the finances, the coordination, or even the capability to facilitate this alternative method of financing infrastructure. As recently as 2014 at the 40th Water Group Coordination Meeting, donors were asked to place the locations of their projects on a physical map in an effort to curtail the duplication of projects between the autonomous authorities.⁶² This shows that development projects are contracted with little coordination between the autonomous authorities and that the government is not doing its part to manage the situation at the state level. Furthermore, it has been argued that the Lebanese government's goals revolve around improving water delivery and management while minimizing investment by the state.⁶³ Yet lack of investment and interest in providing substantial reform of the water sector has created an untenable situation for the refugees, private interests, and the state.

The overarching detrimental factor to the implementation of reforms to water governance in Lebanon has been that water is considered a public good to the population,

⁵⁹ Catafago, "Water Sector in Lebanon," 76.

⁶⁰ *Ibid.*, 77.

⁶¹ UNECE, *Guidebook on Promoting Good Governance*, 2.

⁶² SISSAF, "Water Governance in Lebanon Picks up Stronger Momentum," January 12, 2015, <http://sissaf-lebanon.eu/news-and-events/news/water-governance-in-lebanon-picks-up-stronger-momentum/>.

⁶³ Yamout and Jamali, "Public Private Partnership," 628.

not a commodity suitable for revenue as the government would like.⁶⁴ Viewing water as a public good is prevalent in places with underdeveloped infrastructure and limited capacity to regulate the resource, while in states with developed infrastructure, people are accustomed to paying for clean water.⁶⁵ There is no codified history of water law in Lebanon for comparison, but an examination of prior bylaws traces this view of water usage to before the 1700s.⁶⁶ This fundamental view on water has precluded effective reform and improved governance of this vital resource. High levels of illegal well digging, estimated at 20,000 in the greater Beirut area alone, contribute greatly to undermining any meaningful reform efforts put forth by the government or the autonomous authorities.⁶⁷ Furthermore, water usage fees do not cover the costs of bringing water to those residents receiving it from officially sanctioned sources.⁶⁸ The Lebanese government needs to encourage the population to fundamentally change its view of receiving water as a right, but it does not have the funding or political will to implement those changes in a timely manner to rectify the current severe water shortages throughout the country.

Water security in Lebanon has historically been viewed through a national security lens focusing on external threats from neighboring states, primarily Israel. Much of the reason for this focus on Israel stems from the Israeli invasion of Lebanon in 1982 and subsequent occupation of roughly 40 percent of the state through 1984.⁶⁹ The overt justification for the invasion of southern Lebanon was to stop raids made by the Palestinian Liberation Organization crossing into Israeli territory. During the occupation,

⁶⁴ Ibid., 621.

⁶⁵ Colin Chartres, Mark Giordano, and Samyuktha Varma, “Water: A Free Public Good or a Market Commodity?” Global Water Forum, last updated September 20, 2010, <http://www.globalwaterforum.org/2010/09/20/water-a-free-public-good-or-a-market-commodity/>.

⁶⁶ Catafago, “Water Sector in Lebanon,” 75.

⁶⁷ “Preserving Lebanon’s Water before the Wells Run Dry,” World Bank, September 30, 2014, <http://www.worldbank.org/en/news/feature/2014/09/30/preserving-lebanon-s-water-before-the-wells-run-dry>.

⁶⁸ Yamout and Jamali, “Public Private Partnership,” 619.

⁶⁹ Hussein A. Amery, “A Popular Theory of Water Diversion from Lebanon: Toward Public Participation for Peace,” in *Water in the Middle East: A Geography of Peace*, ed. Hussein A. Amery and Aaron T. Wolf (Austin, TX: University of Texas Press, 2010), 124.

however, witnesses observed strange construction projects along the Litani River undertaken by the Israelis, thus creating what is known as the water divergence theory.⁷⁰

The fundamental claim made by the water divergence theory is that at some time during the Israeli occupation between 1982 and 1984, an 18-kilometer tunnel was made to link the Litani River to the Israeli side of the Lebanese border.⁷¹ Definitive proof of this redirection of Lebanese waters has been elusive. Even so, government officials, military officers, and academics from both sides of the conflict have made extensive efforts to prove this theory, while others have sought to discredit its claims.⁷² The lack of consensus and inability to prove any water divergence has led the Lebanese government to officially refute any such claims about the Litani River.⁷³

The contradictory nature of the water divergence theory has served the needs of the Lebanese government in terms of framing water security. Conflicting statements made by both Israeli and Lebanese government officials, some confirming the theory and some refuting it, cause the theory to retain some level of recognition throughout the populace. It never completely fades from the memories of those affected by the Israeli occupation, yet it never becomes the rallying cry for action against Israel. Essentially, the water divergence theory has enabled the Lebanese government to deflect issues regarding water security toward Israel as a national security issue instead of focusing on local policies and the inefficiency of the government.

The influx of Syrian refugees poses a significant non-traditional security threat to Lebanon in several ways that directly relate to water governance and security. Now, with over one million refugees vying for limited water resources, the inadequacy of Lebanon's water governance policies is becoming increasingly apparent to citizens and refugees throughout the country. Recently, the Beirut Research and Innovation Center of the Lebanese Center for Studies and Research recognized severe degradations to the quality and quantity of available water as a specific threat Lebanese citizens identify with Syrian

⁷⁰ Ibid., 125.

⁷¹ Ibid., 131.

⁷² Ibid., 131.

⁷³ Ibid., 138.

refugees.⁷⁴ Moreover, Syrian refugees make water security a domestic issue that cannot be deflected toward a rival state. The immediacy and urgency of severe water shortages will not be placated by government inaction and claims by the government of possible Israeli meddling with water resources. This danger to Lebanese water is now associated with individuals residing within the borders of the state, making domestic conflict due to water animosity a distinct possibility. Therefore, the refugees pose a substantial threat to the Lebanese water governance and management policies and practices.

B. JORDAN

Jordan, like Lebanon, has attempted to reform the ways the state governs and manages water delivery to its constituents. Similar to Lebanon, Jordan has attempted to increase the level of privatization in the water management sector with an emphasis on improving delivery services for the populace. Despite this, water governance and management is still largely controlled by the state and private companies have made limited inroads. Jordan still relies upon a highly centralized structure for determining water policy, and this is reinforced by the lack of privatization and accountability mechanisms in the water sector. The influx of nearly one million Syrian refugees presents a significant threat to this framework because the central government is the sole institution capable of implementing new measures to curtail the strain on the limited water resources throughout the state.

Modern water governance and management in Jordan began in 1992 with the establishment of the Ministry of Water and Irrigation (MWI). This institution was designed oversee planning and management of the water supply and coordinate national policy and water strategy throughout the state. Another institution, the Water Authority of Jordan (WAJ), under the authority of the MWI, is responsible for the management of sewer and water systems. A key aspect of the WAJ is that it is not dependent on the MWI financially or administratively. The relationship between the MWI and WAJ set the stage

⁷⁴ Beirut Research and Innovation Center and Lebanese Center for Studies and Research, *Citizens' Perceptions of Security Threats Stemming from the Syrian Refugee Presence in Lebanon* (International Alert, 2015), <http://www.international-alert.org/resources/publications/citizens-perceptions-security-threats-stemming-syrian-refugee-presence>.

for privatization efforts throughout the water sector and Jordan. Additionally, it created an environment that allowed Jordan to separate national water infrastructure policies from water delivery policies.⁷⁵

Another key area of reform within the Jordanian water sector was establishing and enforcing tariffs on water usage by private citizens and commercial businesses beginning in 1997.⁷⁶ Before this time, the costs of delivering water and sewage services to the population were greater than the revenues generated by tariffs because of inefficiencies and the inability of the government to collect fees for services provided.⁷⁷ Concerning the new tariff system, Jan-Erik Gustafsson, Rebhieh Suleiman, and Lisa Van Well offer the following explanation:

The new mechanism differentiates between residential and non-domestic commercial users. It changed from a progressive block tariff structure of six water-consumption blocks, at a fixed charge for both residential and commercial consumers, to a four-part tariff for domestic users and a proportionally higher rate for commercial users.⁷⁸

The tariff's bias toward domestic users has forced larger commercial users to purchase water from private vendors who are able to deliver water at lower prices largely through the usage of illegal and unregulated wells.⁷⁹

Despite the drastic institutional and fiscal reforms to the water sector with the creation of the MWI and the WAJ, Jordan's ability to change the nature of water governance has not advanced far beyond the creation of these two institutions and the establishment of the largely ineffectual tariff system. The Organization for Economic Co-operation and Development (OECD) suggests Jordan's water sector would benefit from consolidating responsibilities from many uncoordinated agencies and closing holes in

⁷⁵ Rebhieh Suleiman, Lisa Van Well and Jan-Erik Gustafsson, "Governance of the Amman Water Utility," *Development in Practice* 18, no. 1 (2008): 54, <http://www.jstor.org/stable/27751875>.

⁷⁶ *Ibid.*, 55.

⁷⁷ *Ibid.*

⁷⁸ Suleiman, Van Well, and Gustafsson, "Amman Water Utility," 55, 56.

⁷⁹ *Ibid.*, 56.

regulations pertaining to tariffs and the performance of water utility services.⁸⁰ The main source of concern that has precluded larger scale privatization and reform is the economic environment.⁸¹ Currently, the fiscal climate in the Jordanian water sector is not conducive to private investment and innovation. The tariff structure does not recover the operational costs of delivering water to customers, and the state does not have the financial resources to make up the shortfall to promote private business growth.⁸² Jordan has an unsustainable water sector in desperate need of policy reform, but fiscal constraints make maintaining the status quo the easy course of action.

As expected in Jordan's governance structure, there is almost no government accountability in the water sector, and there is a severe lack of stakeholder engagement in policy formulation. Both detract from the state's ability to effectively govern and manage water resources.⁸³ Without addressing these aspects, the water sector will most likely continue to practice inadequate governance because there are few, if any, means for constituents to provide feedback to improve water management mechanisms. Even with the most basic aspects of governance, such as contract standardization, performance reviews, and feasibility studies, both the MWI and WAJ fall short of providing transparent policies and reasoning behind their practices.⁸⁴

Another significant issue compounded by the lack of stakeholder engagement is the tariff structure, which holds unintended consequences for the people of Jordan. Water sector stakeholders including customers, donors, private enterprises, and government officials tasked managing water resources.⁸⁵ At the outset of water sector reforms, the tariff structure was intended simply to cover the costs of operation and maintenance, with the additional benefit of assisting low-income residents through the progressive nature of

⁸⁰ Organization for Economic Co-operation and Development [OECD], *Water Governance in Jordan: Overcoming the Challenges to Private Sector Participation* (Paris: OECD Publishing, 2014), http://www.keepeek.com/Digital-Asset-Management/oecd/governance/water-service-governance-in-jordan_9789264213753-en#page1, 9.

⁸¹ Ibid.

⁸² Ibid.

⁸³ Ibid.

⁸⁴ Ibid., 15, 22.

⁸⁵ Ibid., 69.

the increasing block tariff system.⁸⁶ This tariff system is designed for those who use less water to pay a small fee, and as water usage increases, so does the fee for delivery through the state owned infrastructure.⁸⁷ The assumption by the central government is that lower income households use less water; however, some reports estimate that higher income households make up the majority of the water users in the lowest tariff block under the current structure.⁸⁸ This reverse outcome is due to higher income families being better able to maintain the infrastructure in their homes, including fixing leaking pipes and faucets. Additionally, inhabitants of these residences are generally better educated and are more aware of the water scarcity in Jordan, which makes them able and willing to actively take measures to conserve water. As a result, lower income households that are supposed to be the primary benefactors of the increasing block tariff generally cannot easily take advantage of the tariff structure. For obvious reasons, such as the lack of financial resources to fix leaking pipes and fewer educational opportunities, which leaves these same households uninformed on water conservation, these families are unwittingly forced into a higher block of the water tariff. Moreover, lower income households are most often not part of the central sewage network and that means they pay significantly higher rates for water treatment and sanitation services.⁸⁹ Few avenues for stakeholder involvement and no government accountability are two preconditions that have created the situation whereby the most vulnerable constituents of the Jordanian water sector are adversely impacted by the very policies meant to provide them with assistance.

No analysis of water governance and management in Jordan would be complete without examining the agricultural sector and its influence on policy pertaining to water. The agricultural sector's importance in the development of water policy stems from the network of patron-client relationships created by King Hussein during the 1950s and 1960s. These relationships became a strong source of support for the central government

⁸⁶ OECD, *Water Governance in Jordan*, 34, 37.

⁸⁷ *Ibid.*, 39.

⁸⁸ *Ibid.*, 37.

⁸⁹ *Ibid.*

at a time when many urban political movements were openly questioning the authority of King Hussein. Thus, the rural elites, predominantly holding agricultural interests, became entrenched in the Jordanian political process. In an effort to foster the relationship, much leeway was granted to them to develop water policies that specifically benefit agriculture and rural landowners.⁹⁰

One of the consequences of this patron-client network is that the agriculture sector enjoys unregulated pumping of water at virtually no cost. The main factor behind this is the power of the agriculture lobby in Jordanian politics. Several laws have been passed to curtail the unabated pumping of water by farmers, but in each case, the lobby has been able to significantly alter the legislation or blatantly disregard the law. Moreover, the government is willing to do little more than rubber stamp legislation promoting water conservation for agricultural use despite the fact that the agriculture sector is responsible for the vast majority of water consumption in Jordan. Agricultural interests have precluded any significant reforms to the water sector. This influence has also inhibited other stakeholder influence on water policy and has decreased the urgency for government transparency and accountability toward any other interests.⁹¹ It remains unclear when water policies will become an issue of demand by Jordanians against the interests of entrenched political elites.

Jordan faces potential domestic political conflict due to the strain Syrian refugees place on its scarce water resources. The impact of the refugees is most apparent in poor rural communities that have had water deliveries significantly curtailed as a result of the influx in refugees.⁹² For example, in the villages outside the Zaatari refugee camp, Jordanians watch tankers, which once brought them water, pass through without stopping on their way to the refugee camp. The strain on resources has fostered a growing hostility

⁹⁰ Scott Greenwood, "Water Insecurity, Climate Change and Governance in the Arab World," *Middle East Policy* 21, no. 2 (2014): 142, <http://mepc.org/journal/middle-east-policy-archives/water-insecurity-climate-change-and-governance-arab-world>.

⁹¹ *Ibid.*, 41.

⁹² Rania Abouzeid, "Jordan's Rural Chafe under the Burden of Hosting Syrian Refugees," *Al Jazeera*, October 21, 2013, <http://america.aljazeera.com/articles/2013/10/21/jordana-s-rural-poorchafeundertheburdenofhostingsyrianrefugees.html>.

between Jordanians and the refugees.⁹³ Political elites will likely attempt to take advantage of this situation, blaming the refugees to divert attention from their own role in creating the problem of water scarcity. Jordanian patronage politics have essentially created the water shortage seen today, but the same political structure may demonize the very group of people who have shown how truly ineffectual the state has been at managing and governing water resources—the refugees.

Water security in Jordan is tied to domestic pressures on policymaking, but also closely related to national security factors that impact neighboring states. Dwindling resources and fierce competition over the remaining resources are a common theme throughout the Middle East, but Jordan in particular faces unique circumstances when faced with water security. Jordan already has one of the lowest per capita water consumption rates in the world at 145 cubic meters annually, but high fertility rates and the surge of Syrian refugees threaten to shatter the fragile international water sharing agreements with neighboring states and drive water availability and consumption to even lower levels.⁹⁴

Jordan is in a precarious situation with regard to securing its own water resources. The main waterways that Jordan relies upon are the Jordan river and the Yarmouk river, which also constitute borders between Israel and Syria, respectively. A key challenge to Jordan's usage of these rivers is that their headwaters originate in Lebanon, Syria, and Israel, which has led those countries to claim specific water usage rights of these sources.⁹⁵ Therefore, Jordan is most often excluded from undertaking unilateral development projects along these rivers that could potentially provide it with increased storage and delivery capacity. Given this riparian framework, Jordan has sought cooperation with other states, traditionally Syria, to gain access to increasing shares of available water. Unfortunately, cooperation with Syria has soured relations with Israel,

⁹³ Ibid.

⁹⁴ Heslot, "Jordan's Food and Water Security."

⁹⁵ Fischhendler, "Ambiguity," 94.

which have been contributing factors in conflicts, most notably in 1953 and 1967, resulting in major changes of control of the water resources in Israel's favor.⁹⁶

The Israel-Jordan Peace Treaty of 1994 drastically changed the relationship between the two states by settling all land and water disputes and regulating water resources that are shared along their borders.⁹⁷ While the treaty did settle disputes over water between the two states, it has had a marginal impact on regulating any type of equitable water extraction between Israel and Jordan, with the vast majority of resources being controlled and extracted by Israel. A realistic view of this agreement is that it was signed for largely political reasons, with very few details actually agreed upon by either Jordan or Israel. Despite the landmark nature of the agreement and its supposed benefits, it has not significantly increased Jordan's water security.

Three issues within the treaty were intentionally vague and unresolved, as to enable the signing of the treaty by both parties.⁹⁸ Fischhendler argues that the first point to be negotiated was the division of resources of the Yarmouk and Jordan Rivers as well as the aquifer in the Arava/Araba desert. However, the treaty does not clearly delineate any substantial change in resource management from either party. Second, Israel and Jordan attempted to set the criteria needed for dividing water equitably between the two states, but came to no substantial agreement. Finally, the issue of unilateral development projects impacting shared resources was discussed during negotiations but not clarified. In each case, an issue deemed to be critical to the treaty was discussed during negotiations; yet none of these was effectively resolved by the treaty of 1994, demonstrating each country's preference for superficial political victories as opposed to a substantive constructive agreement between states.⁹⁹

Several factors significantly impacted the decision to formulate an agreement on paper, which both states knew would not substantially change the distribution of resources throughout the region. Cost and location of additional infrastructure needed to

⁹⁶ Ibid., 96.

⁹⁷ Ibid., 97.

⁹⁸ Ibid., 104.

⁹⁹ Ibid., 105.

carry out the terms of the treaty were never agreed upon, nor did they agree upon a schedule for implementing changes in the allocation of water. Additionally, the division of resources was based off of historical withdrawals, but those statistics were either non-existent or disputed by both states. Finally, upstream development projects conducted by Jordan and Syria were only allowed should they not harm Israeli interests downriver, but Israeli interests were never defined. It is clear that under these terms, no substantial change to resource sharing would be reached between Jordan and Israel through the 1994 treaty.¹⁰⁰

In the context of ineffective water governance and symbolic but hollow agreements to secure additional resources, large numbers of Syrian refugees could become a significant force with potentially destabilizing ramifications. The impact the refugees have on Jordan's limited water supply cannot be overstated for domestic water policy. With nearly one million more people using water, the practices of the agricultural industry have become unsustainable and continuing to support those policies may result in large-scale civil unrest as water supplies dwindle further. The Jordanian government will soon be in a position where it has to choose between providing water to the population and refugees or to the agricultural political support base it so desperately needs. Moreover, the backlash from the government's inability to generate any meaningful advancement in water security vis-à-vis Israel could prove significant as well. The influx of Syrian refugees may act as the impetus for the Jordanian people to demand changes in water policy that will ripple throughout the Middle East.

C. SUMMARY

Policies on water governance and regional actions to secure more water resources have had a significant impact on Lebanon and Jordan. Both states have sought to privatize their water sectors to make them profitable, albeit for different reasons. Lebanon seeks improvements with minimal government spending involved, and Jordan has kept control in the hands of the government with no aspirations of decentralizing policy-making pertaining to water. Water security is a challenge for Lebanon and Jordan, one

¹⁰⁰ Ibid., 97, 99, 100.

that is closely related the role Israel plays in managing regional water resources. The Lebanese occupation from 1982–1984 led Israel to act with impunity while allegedly siphoning resource from the Litani River. The Israel-Jordan treaty of 1994 was touted to have settled all land and water disputes between the two states, but in reality, it proved to be a hollow document unable to allocate resources equally. Under this framework, the possibility for the Syrian refugees to destabilize society grows exponentially. As has been seen in Lebanon and Jordan, the inadequacies of water governance and security will continue to create pressure for change as international scrutiny increases on nations hosting refugees.

III. LEBANON'S WATER AND THE REFUGEES

The influx of Syrian refugees into Lebanon and their effect on available water resources presents a significant non-traditional security threat. Aside from simply more people needing water in an environment with scarce availability, a host of other factors comes into play when determining the impact of refugees on this state. Not only is the available water depleted faster, but the inadequate infrastructure is also strained past its limits, an act which has significant consequences for the refugees and Lebanese society as a whole. Furthermore, the effects of the refugees on water supplies are felt disproportionately throughout the state but impact those closer to large populations of refugees more than others. The Lebanese government's ability to respond to these issues as well as its ability to leverage international organizations and resources to mitigate these factors will eventually determine the severity of the potential sociopolitical threat posed by the Syrian refugees.

The water sector in Lebanon has fallen behind in terms of development, largely since the end of the Civil War.¹⁰¹ The lack of development is not only apparent with regulations and governance but also with the physical infrastructure that is used to provide water to roughly 4.5 million Lebanese citizens. Moreover, the lack of development is more acute in some areas than others. For instance, in the Akkar Governorate in northern Lebanon that hosts approximately 110,000 refugees, and in the governorate, even lower levels of infrastructure development than found in the rest of the country are common.¹⁰² A recent United Nations High Commissioner for Refugees (UNHCR) study discovered that prior to the arrival of Syrian refugees, 79 percent of the state had access to drinking water, but only 54 percent of those in the Akkar region had the same access to water.¹⁰³ The refugees have caused a sharp decline in the amount of

¹⁰¹ United Nations High Commissioner for Refugees [UNHCR], *WASH Assessment of Syrian Refugee Households in Akkar Governorate* (New York: UNHCR, 2014), http://www.reachresourcecentre.info/system/files/resource-documents/reach_lbn_akkar_report_washhouseholdassessmentakkar_dec2014_1.pdf.

¹⁰² *Ibid.*, 1.

¹⁰³ *Ibid.*, 12.

water available for those in the Akkar region simply due to the sheer numbers that have settled in the governorate.

Further complicating the lack of water infrastructure in the region are the types of settlements where the refugees are residing. It is estimated that 45 percent of the refugees in the Akkar Governorate live in either substandard buildings or informal settlements. The UNHCR defines substandard buildings as “Garages and shops, warehouses, one room structures, unfinished buildings, and other privately owned, unfinished, or otherwise substandard shelter units not originally intended to serve as dwellings are generally treated and assessed similarly by humanitarian partners in Akkar.”¹⁰⁴ Informal settlements are loosely defined by UNHCR as tents or other handmade structures.¹⁰⁵ What both of these UNHCR definitions suggest is that roughly 45 percent of the refugee population in the Akkar Governorate is living in structures or areas that were never intended to have permanent water infrastructure or services provided by state infrastructure.

The result of large numbers of refugees taking up residence in substandard or temporary shelters is evident when the source of what little water they do have access to is examined. Once again, in the Akkar Governorate 79 percent of refugees in informal settlements and 41 percent of refugees in substandard structures receive water from wells, which means 46 percent of all refugees in the region use wells for water.¹⁰⁶ There is little reason to assume that the wells used by refugees in the Akkar region are sanctioned or regulated by the Lebanese government in any way. A commonplace arrangement is for those that own the property on which an informal settlement or substandard structure are erected to dig the well and include water charges as part of the rent paid by the refugees.¹⁰⁷ Though this informal system is able to provide water to refugees in need, the water is often of very low quality and refugees often have no way to filter out contaminants. Moreover, this arrangement removes the central government from delivery

¹⁰⁴ UNHCR, *WASH Assessment*, 11.

¹⁰⁵ *Ibid.*

¹⁰⁶ *Ibid.*, 13.

¹⁰⁷ *Ibid.*

of the service and removes any revenue that the state would be able to use to actually improve the infrastructure for the refugees and local population sharing the burden of scant water availability.

The growing trend of digging wells for water outside the purview of the state is significant not only in the northern reaches of Lebanon, but also in the capital city of Beirut. The World Bank estimates there are 20,000 illegal wells in and around Beirut, mostly used for private water trucks to deliver water in and around the city.¹⁰⁸ Though this trend most likely started well before the arrival of over one million Syrian refugees in Lebanon, the dramatic influx of Syrians undoubtedly accelerated the rate at which the illegal wells were dug. This suggests that not only are the Syrian refugees willing to rely on informal networks and arrangements to meet their needs, but also Lebanese citizens are relying less on the state to provide public goods. Moreover, the digging of illegal wells used by both refugees and citizens illustrates the shortcomings of the state-run infrastructure and its inability to cope with the Syrian refugees.

Not only does the inadequate infrastructure lead individuals to secure water through means outside of state control, but also the unregulated increase in water extraction through illegal wells has significant negative impacts on the quality of water for the Syrian refugees and Lebanese citizens as well. The increased levels of extraction have caused the water table to drop to alarmingly low levels, causing seawater intrusion into the central water supply.¹⁰⁹ The most dramatic example of the declining water quality is in Shatila refugee camp in a southern suburb of Beirut.¹¹⁰ Tap water in this camp is a salty and repugnant smelling liquid that is said to rust silverware after only roughly 30 minutes upon exposure.¹¹¹ These reports from the Shatila refugee camp are not exaggerations, but they are certainly the most extreme examples of the poor water

¹⁰⁸ World Bank, “Wells Run Dry.”

¹⁰⁹ Fanack, “Water Quality,” last modified November 3, 2015, <https://water.fanack.com/lebanon/water-quality/>.

¹¹⁰ Schwartzstein, “Syrian Refugees in Lebanon Camp.”

¹¹¹ Ibid.

quality. Even in many Lebanese communities in Beirut, water quality has degraded to the point that at times tap water has too much salinity for consumption.¹¹²

The Lebanese water infrastructure was not able to meet demand before arrival of the Syrians, let alone afterward. The true problem the refugees have exacerbated is the illegal digging of wells for unregulated extraction, though this practice has been already in use throughout the state. These illegal wells do provide water to the refugees and Lebanese citizens who are the most vulnerable to water shortages, but they have several negative consequences for the national water outlook. Essentially, the informal networks used by refugees and citizens to get water are impacting the ability of the government to improve the infrastructure because of the significant amounts of lost revenue for the state. The refugee crisis has merely underscored the degree to which the state of Lebanon's infrastructure cannot cope with the increased strain imposed by over one million Syrians.

Non-governmental organizations (NGOs) have made great efforts to bridge the gap between infrastructure shortfalls and provision of water to Syrian refugees in Lebanon. A total of \$11.1 million has been allocated through the UNHCR to address sanitation and water supplies in municipalities particularly vulnerable to water shortages.¹¹³ This funding has enabled many NGOs to establish programs that not only benefit the refugees, but also the local Lebanese population, which often finds itself without water as the Syrians do. Beyond simply delivering water and improving infrastructure, many NGOs have established programs that focus on water, sanitation, and hygiene (WASH).¹¹⁴ Despite the programs and projects established to help the refugees and Lebanese, there are many significant hurdles facing NGOs in truly changing the water outlook for people in Lebanon. Organizations attempting to provide access to clean water face an uphill struggle against environmental and structural factors that are frequently unintended consequences.

¹¹² Fanack, "Water Quality."

¹¹³ UNHCR, *WASH Assessment*, 1.

¹¹⁴ Save the Children, "Water Sanitation and Hygiene," accessed March, 27, 2016, <https://lebanon.savethechildren.net/what-we-do/water-sanitation-and-hygiene>.

The most frequent ways aid is provided by NGOs to ease the lack of water faced by refugees is through giving tanks, filters, and pumps to refugees so they are able to have a centrally located water source and the ability to decontaminate potentially unclean water.¹¹⁵ This form of aid, however, still relies upon dwindling amounts of ground water that has already become more contaminated with the increased extraction. Furthermore, many of the tanks provided by NGOs are filled using the existing water infrastructure, where available, which is notoriously unreliable. If unable to connect to the infrastructure, water from illegal wells at informal settlements is collected and stored, which is equally poor, if not worse, in quality than water from the state infrastructure. This is particularly problematic because UNHCR has determined there is a significant amount of contamination in most of the water sources accessed by refugees due to excessive extraction, chemical runoff from farming, and lack of adequate wastewater treatment.¹¹⁶

In the most desperate cases, water is trucked to the informal refugee settlements, completely bypassing the potential contamination brought by wells or piped water from the central infrastructure.¹¹⁷ This method has provided temporary relief to some refugees, but it is unsustainable for over one million refugees. Moreover, because of the difficulty in arranging water deliveries, frequently settlements only receive a water delivery biweekly while others are completely overlooked.¹¹⁸ A further complication is that when deliveries are made, there is a rush by refugees to collect as much water as possible, which rapidly depletes the delivery. This then means it is often several days or a week from the time when the communal tank is emptied until the next delivery.¹¹⁹ Since the refugees generally do not have any means of uncontaminated storage for the water they

¹¹⁵ Maya Gebeily and James Haines-Young, "High and Dry: Syrian Refugees Have Been Severely Affected by the Water Shortages," *Executive*, October 30, 2014, <http://www.executive-magazine.com/economics-policy/water-high-and-dry>.

¹¹⁶ *Ibid.*

¹¹⁷ Heather Murdock, "Water Shortages in Lebanon Devastate Syrian Refugees," *Voice of America*, December 23, 2014, <http://www.voanews.com/content/water-shortages-lebanon-syrian-refugees/2571595.html>.

¹¹⁸ Gebeily and Haines-Young, "High and Dry."

¹¹⁹ Murdock, "Water Shortages in Lebanon."

extract from the communal tank, a significant health risk is still present even when clean water is brought to the informal settlements.

NGOs have limited ability to guarantee the safety of water they deliver all the way to the end user. To address this issue, many organizations have undertaken projects to improve the physical infrastructure provided by the state.¹²⁰ The unfortunate consequence is that the efforts must also be coordinated through the appropriate Lebanese government offices, which are consistently understaffed and underfunded.¹²¹ Though the NGOs may be ready to commence a project that would drastically increase the quality of life for numerous refugees and Lebanese citizens, government bureaucracy and rampant corruption often stands in the way, usually causing significant delays or derailing the projects entirely.

Another factor inhibiting the effectiveness of many NGOs to provide adequate water to refugees is the increasing restrictions placed on visas for foreign workers to enter Lebanon. Several NGOs have scaled down their operations due to the current visa restrictions.¹²² There are also proposed restrictions that would further limit foreign employees to 10 percent and would also apply to NGOs providing emergency relief to refugees.¹²³ The supposed justification by the central government is to facilitate the hiring of Lebanese workers and professionals given the high unemployment rate.¹²⁴ Unfortunately for NGOs specializing in water, this particular field of expertise has been neglected by Lebanon for years, and there is little, if any, indigenous expertise to be gained from hiring locally. Thus, many NGOs are finding their efforts futile because they are unable to get the experts necessary to address the water crisis in the country. Furthermore, some smaller NGOs have been forced to leave Lebanon because they are

¹²⁰ United Nations High Commissioner for Refugees [UNHCR], *Support to Lebanese Host Communities and Public Institutions: Under the Sixth Regional Response Plan (RRP6-2014)* (New York: UNHCR, 2014).

¹²¹ Ruth Michaelson, "Refugees Pay the High Price of Lebanese Cost-cutting," *Al Jazeera*, April 30, 2015, <http://www.aljazeera.com/news/2015/04/refugees-pay-high-price-lebanese-cost-cutting-150412095256439.html>.

¹²² *Ibid.*

¹²³ *Ibid.*

¹²⁴ *Ibid.*

unable to operate under the new employment restrictions, which further diminishes services to the refugees.¹²⁵

The restrictions placed on many NGOs by the Lebanese government, including those proposing water infrastructure projects, is somewhat paradoxical when viewed as a part of the greater refugee situation and its impact on water in the state. The government understands the water shortage and the impact of the Syrian refugees on remaining resources. Recently, an official at the Ministry of Energy and Water stated, “Because of the Syrians, a water balance that should have been negative in 2030 is negative now.”¹²⁶ Furthermore, the Lebanese government recognizes that, in addition to an already beleaguered population of over four million citizens, it is understaffed to manage water demand for an additional one to two million refugees.¹²⁷ There is a clear separation between the resources and expertise in the government and what is truly needed to improve water availability and safety to informal refugee settlements as well as the affected Lebanese communities.

Even with this knowledge, the government still supports a policy that forbids dedicated refugee camps.¹²⁸ In conjunction with the restrictions placed on NGO work visas (to encourage domestic hiring), attempts to improve the water infrastructure for both the refugees and Lebanese population are severely impeded. With refugees spread out across the state, infrastructure improvements provide only a local benefit at best. Additionally, the dispersion of the refugee populations requires an even greater level of coordination across NGOs. In the early stages of the crisis, many efforts were duplicated with multiple water tanks being delivered to the same refugee settlement while other settlements were overlooked.¹²⁹ There is also a drastic difference in the aid certain

¹²⁵ Adam Roberts, “Foreigners in Lebanon: Show Us Your Papers,” *The Economist*, August 19, 2014, <http://www.economist.com/blogs/pomegranate/2014/08/foreigners-lebanon>.

¹²⁶ Schwartzstein, “Syrian Refugees in Lebanon Camp.”

¹²⁷ Ibid.

¹²⁸ Michaelson, “Refugees Pay the High Price.”

¹²⁹ Bassem Saadallaoui, “Competing for Scarce Resources: The New Concern for Syrian refugees and Host Communities in Lebanon,” ENN, accessed April 12, 2016, <http://www.ennonline.net/fex/48/competing>.

settlements receive compared to others. Without question, NGOs are providing the best water delivery services within their capabilities, but the varying degrees of support of the receiving communities throughout the state creates an avenue for social unrest focused against the government and NGOs alike.

The social and political repercussions of the Syrian refugees with regard to the Lebanese water supply are difficult to discern apart from the effects of the refugee crisis as a whole. Water availability has been a problem in Lebanon even prior to the arrival of over one million refugees; however, the influx of refugees has brought much international attention to the scarcity of water in the state. Though specific conclusions cannot be drawn at this time to link water availability directly to social or political unrest, the lack of water for refugees and the impact on the Lebanese population has the potential to negatively impact society by exacerbating preexisting issues. Furthermore, the attention and assistance the refugees receive could inflame social tensions and xenophobia as well as highlight the ineffectual policies of the Lebanese government, which were designed to mitigate the crisis, yet have harmed many refugees and citizens of Lebanon.

With the Syrian civil war entering its fifth year, Lebanese hospitality is waning and there is increasing social discord, often at the expense of the refugees.¹³⁰ One of the major grievances of the Lebanese population revolves around employment and the negative effects of the Syrians on local labor markets. Unemployment rates for Lebanese have roughly doubled since the influx of the refugees, reaching 24 percent, but rates soar higher among younger demographics.¹³¹ Further compounding the issue, wages are significantly lower for refugees working illegally compared to their legal citizen counterparts. Estimates show that Syrians are working for wages that are 40 percent below the state mandated minimum wage, which has driven the perception that the

¹³⁰ David Schenker, "Syria's Good Neighbors: How Jordan and Lebanon Sheltered Millions of Refugees," Washington Institute, September 28, 2015, <http://www.washingtoninstitute.org/policy-analysis/view/syrias-good-neighbors-how-jordan-and-lebanon-sheltered-millions-of-refugees>.

¹³¹ Ibid.

refugees are putting Lebanese citizens out of jobs and created a sense of resentment amongst communities.¹³²

Another factor greatly complicating the nature of the refugee crisis for Lebanon is the demographic shift of hosting a majority Syrian Sunni population, which totals 1.3 million registered refugees in the state.¹³³ This influx has the potential to drastically change the delicate sectarian political balance between the various religious groups represented in Lebanon. The majority of Syrian refugees are located in the Sunni dominated northern governorates of Lebanon and the major coastal cities of Beirut and Tripoli. Growth of refugee settlements in the south have caused increased strains because southern Lebanon is a majority Shi'a area and the powerbase for the predominately Shi'a Hezbollah in Lebanon.

Additionally, most large scale NGO support is focused on delivering services to refugee populations in the northern reaches of Lebanon. Since the circumstances are so dire for those large informal settlements, most NGOs have reached their capacity to deliver aid, leaving few options for assistance to refugees located elsewhere. Given this, the burden for hosting refugees in southern Lebanon is placed primarily on the existing communities with little chance of receiving substantive help from the international community for the foreseeable future.¹³⁴

Though no sectarian conflict has broken out in southern Lebanon, tensions have risen between the Sunni Lebanese and Sunni refugees in the north over inequality in aid provided by NGOs. In an attempt to keep order, host communities have placed curfews and other restrictions on the refugees.¹³⁵ Also, violence has increased, particularly toward women, in those areas with large refugee populations.¹³⁶ This is a potential factor that has led to a perceived injustice faced by the local Lebanese. The vast majority of NGO

¹³² Ibid.

¹³³ "Syrian Refugees Head to Lebanon's Shia South," *IRIN News*, January 29, 2013, <http://www.irinnews.org/report/97355/syrian-refugees-head-lebanon's-shia-south>.

¹³⁴ Ibid.

¹³⁵ Schenker, "Syria's Good Neighbors."

¹³⁶ Ibid.

aid, whether food, water, or services is directed toward refugees. Where the resources of NGOs fall short, the local community fills in to provide for the refugees, often involuntarily with the digging of illegal wells or informal settlements being constructed on their land. This dynamic between NGOs and refugees in host communities has led many local populations to feel neglected by aid organizations since many Lebanese are just as destitute as the refugees they are hosting, yet are not eligible to receive aid directed for the Syrians.

The political climate in Lebanon also contributes to the potential for social upheaval due to refugee and water issues. The Lebanese reaction to the Palestinian refugees in 1948 created the undertones paralleling the political realities facing the Syrians today. The Palestinians upset the domestic balance of power within Lebanon, which was based upon maintaining the balance between Sunnis, Shiites, and Christians. The Palestinians were discriminated against through state policies that prevented them from land ownership and legal employment. The goal of these policies was to create an environment where seeking refuge in another state would be preferable to staying long-term in Lebanon. Unfortunately, these same policies are directed at the Syrian refugees nearly 70 years later. The overarching goal of the Lebanese government is to ensure that the migration of Syrians in Lebanon is a temporary situation, even though the policies used to facilitate that goal have failed in the past, particularly with the Palestinians.¹³⁷

An additional factor that is potentially a consequence of the restrictive policies employed by the Lebanese government is the increase in radicalization, particularly among the Sunni community within Lebanon. As recently as 2014, Lebanese government officials made statements referring to the refugees as a threat to security and even postulated that a significant number of the refugees had received prior military training.¹³⁸ Regardless of whether such statements are factually correct, they demonstrate the underlying suspicion that the central government harbors toward the refugees and informs its policies. Thus, many communities have shown their mistrust for the refugees

¹³⁷ Schenker, "Syria's Good Neighbors;" Michaelson, "Refugees Pay the High Price."

¹³⁸ Raphaël Lefèvre, "Tackling Sunni Radicalization in Lebanon," Carnegie Middle East Center, December 24, 2014, <http://carnegie-mec.org/publications/?fa=57592>.

by implementing their own discriminatory policies. Violence, discrimination, and curfews are commonplace tactics used throughout host communities to control or eventually evict refugees living in informal settlements, and those refugees have no recourse to improve their situation because the government of Lebanon condones the actions taken against the refugees.¹³⁹

The consequences of government and community actions toward the Syrian refugees are significant when analyzing the social friction within Lebanon. Without the ability to use the local authorities to stop the discriminatory actions against them, the Syrian refugees are pushed toward using informal networks to meet their needs. Raphaël Lefèvre of the Carnegie Middle East Center offers this summary of the situation:

The multiplication of informal settlements, the deterioration of the socioeconomic situation, and the absence of a short-term prospect for the creation of safe refugee camps may push a number of Syrians toward militant groups, which often provide financial incentives, care for families, and offer a temporary sense of security.¹⁴⁰

Essentially, the refugees will find security wherever it may be present, either through NGO support or through avenues outside the purview of the state or international organizations. The non-state or NGO organizations have a significant potential to get swept into the rising trend of sectarian violence occurring in Lebanon, thus drawing Syrian refugees into those preexisting conflicts.

The scarcity of water and the impact that Syrian refugees have on the supply are not the direct cause of the social and political tensions seen today throughout Lebanon. Many of the issues regarding water throughout the state have been present since long before the arrival of the refugees. Though not directly related, the lack of water for the refugees and citizens alike could become a mobilizing factor deepening the divisions within Lebanon. As basic needs cannot be met by the state, informal networks and organizations will increasingly fill the void left by the state in efforts to meet the needs of their constituents. The danger is that violence is increasing throughout the state for

¹³⁹ Ibid.

¹⁴⁰ Ibid.

various reasons and the scarcity of water is becoming another reason for violent activity. Furthermore, the mainly sectarian militancy seen in Lebanon has the potential to turn on the Syrians because they are primarily Sunni refugees. The demand for water as a basic need could inflame the social, religious, and political tensions with which Lebanon is struggling to cope.

The refugee crisis has highlighted the desperately inadequate state owned water infrastructure to provide valuable resources, not only to the Syrians, but also to the Lebanese. Compounding the issue of poor infrastructure, the government has also implemented ineffective policies for managing the flow of refugees and providing water to all within the borders. To combat the shortage of water and desperate conditions the refugees face, NGO organizations have greatly stepped up support to provide aid to the Syrians, but labor policies and sanitation concerns have greatly hampered these efforts. These conditions have pushed many refugees to rely on informal networks and organizations to meet their basic needs; however, the growing trend of militancy and violence throughout Lebanon has the potential to draw Syrians into conflict through groups operating within Lebanon. Perhaps it is only a matter of time before the lack of basic needs, such as water, serves to mobilize the people within Lebanon against the government or themselves; this makes the water crisis a non-traditional security threat.

IV. JORDAN'S WATER AND THE REFUGEES

Water scarcity in Jordan is a politically charged issue receiving significant amounts of scrutiny at the local and national levels. Inadequate infrastructure and governance have plagued the state, making the water crisis even more severe. The massive flow of Syrian refugees into Jordan has compounded many of the issues that the beleaguered water sector has attempted to rectify, and the results have been disastrous for both the state and the refugees. Interestingly though, neither of these issues are new to Jordanians, who have been under water restrictions since the 1980s and have hosted several different refugee populations for significant amounts of time. Despite Jordan's familiarity with both water scarcity and refugees, these two issues have collided in ways that have the potential to destabilize the state in ways not seen before, making the issues significant non-traditional security threats. As the capacity of the Jordanian water infrastructure is strained in increasingly intense and unanticipated ways, NGOs are attempting to fill the gap of services. In addition, new social and political divisions are more prevalent both within and between refugees and host communities. As the conflict in Syria drags on, the problems facing Jordan and its refugee population will continue to grow and intensify.

The Syrian refugees have a significant impact on the water infrastructure in Jordan by highlighting the government's inability to provide necessary services throughout the state. The Sumaya pump station is a prime example how several factors negatively impacting water availability have compounded to make the situation worse. Located in the north of Jordan, the pump station has traditionally been responsible for providing water to roughly 80,000 Jordanians. Even with this population prior to the refugee crisis, the station provided intermittent water flow at best. The influx of Syrian refugees has forced this pumping station to provide services to over 200,000 people, which represents a 250 percent increase in demand. Further hampering the pumping station's ability to meet demand is the significant amount of water leaking out of the rundown pipes. Up to 75 percent of water from the Sumaya pump station is estimated to

be lost from leakage.¹⁴¹ The scenario at this station is commonly repeated across towns and villages located in the northern parts of Jordan. Moreover, throughout the entirety of Jordan, it is currently estimated that 76 billion liters of water are lost annually through poor infrastructure, equating to enough water for 26 million people to sustain themselves at a consumption rate of 80 liters per day.¹⁴²

Another way in which the Syrians impact Jordanian infrastructure is through the construction of refugee camps. The largest of the camps, known as Zaatari, has had significant effects on the surrounding infrastructure. Built somewhat hastily to house the fleeing Syrians, this camp now holds approximately 80,000 refugees.¹⁴³ Located in the desert close to the Syrian border, the camp does not have direct access to Jordanian infrastructure. To provide water to the camp, extraction from the village wells across the nearby town of Mafraq cover the needs of 80 percent of refugees within the camp.¹⁴⁴ This solution is unsustainable and has negatively impacted the infrastructure and resources available to the two villages within close proximity to the camp. Prior to the construction of the camp, the aquifer from which the villages in Mafraq draw was decreasing rapidly from over extraction.¹⁴⁵ Unfortunately, the consequence of the decreasing water levels is that the Jordanians in Mafraq, and across the northern parts of Jordan, are relegated to receiving water only one or two times per week.¹⁴⁶

The inability to effectively deliver water to both refugees and Jordanians represents only half of the infrastructure problems exacerbated by the crisis in Syria. Wastewater and sewage infrastructures are completely overwhelmed due to the increase

¹⁴¹ Mercy Corps, *Tapped Out*, 19.

¹⁴² *Ibid.*, 9.

¹⁴³ United Nations High Commissioner on Refugees [UNHCR], "Syria Regional Refugee Response," May 14, 2016, <http://data.unhcr.org/syrianrefugees/regional.php>.

¹⁴⁴ Fanack, "Jordan's Scarce Water Reserves under Pressure from Refugee Influx," last modified November 17, 2014, <https://water.fanack.com/jordans-scarce-water-reserves-under-pressure-from-refugee-influx/>.

¹⁴⁵ Global Risk Insights, "Water Scarcity in Jordan Increases with Refugee Flows," May 31, 2013, <http://globalriskinsights.com/2013/05/water-scarcity-in-jordan-increases-with-refugee-flows/>.

¹⁴⁶ Joby Warrick, "Influx of Syrian Refugees Stretches Jordan's Water Resources even More Thinly," *The Washington Post*, June 16, 2013, https://www.washingtonpost.com/world/national-security/influx-of-syrian-refugees-stretches-jordans-water-resources-even-thinner/2013/06/15/5178a978-d2c6-11e2-a73e-826d299ff459_story.html.

in population since the majority of refugees residing in Jordan do not live in camps but among the local population.¹⁴⁷ Thirty-five percent of the people in areas hosting refugees do not have access to municipal sewage services. Those who do have access have seen drastic increases in infrastructure failures, usually resulting in overflows of raw sewage. Complaints lodged with local infrastructure administrators have doubled or tripled in many communities as a result of broken or clogged sewage systems. These infrastructure breakdowns have the potential to lead to groundwater contamination, which could have catastrophic effects on the already dwindling water supply.¹⁴⁸

Perhaps even more damaging to the remaining water supplies are the issues of wastewater and sewage treatment emanating from Zataari refugee camp. Much like there is a lack of infrastructure to bring water into the camp, there is no large-scale infrastructure in place to bring sewage and waste out of the camp. Residents of the camp rely upon a network of ditches, lagoons, and cesspools that are periodically emptied to septic tanks away from Zataari.¹⁴⁹ This opens up the possibility for serious groundwater contamination because Zataari refugee camp sits atop the Shallow Aquifer System and the Upper Cretaceous Aquifer System at greater depths.¹⁵⁰ Essentially, the waste of over 80,000 refugees is seeping into the ground directly above two of the only sources of clean groundwater in the northern part of Jordan because of a lack of proper infrastructure.

A recent study was conducted and published in the *Journal of Environmental Protection* to determine the environmental effects of the camp on the groundwater in and around the Zataari refugee camp. The results revealed that while the camp is responsible for a significant increase in surface pollution, the groundwater was not yet contaminated by the raw sewage from the cesspools.¹⁵¹ The ramifications of the study are somewhat paradoxical for the refugees and Jordanians in close proximity to the camp because in the

¹⁴⁷ Mercy Corps, *Tapped Out*, 1.

¹⁴⁸ *Ibid.*, 20.

¹⁴⁹ Sura Al-Harashseh, Rida Al-Adamat, Seraj Abdullah, "The Impact of Za'atari Refugee Camp on the Water Quality in Amman-Zarqa Basin," *Journal of Environmental Protection* 6, no. 1 (2015): 17, http://file.scirp.org/pdf/JEP_2015011510265820.pdf.

¹⁵⁰ Fanack, "Jordan's Scarce Water Reserves."

¹⁵¹ Al-Harashseh, Al-Adamat, and Abdullah, "Impact of Za'atari Refugee Camp," 23.

short term it means their groundwater remains safe. Because of this, there is no motivation for the government to improve infrastructure in the area since the environment can cope with the waste issue for now. The danger is that the longer the conflict in Syria lasts and the refugees stay, the chances of Zataari polluting the groundwater sources in northern Jordan increase, which would create a water scarcity issue of an entirely different magnitude than the one that is happening now.

The refugee crisis also has an indirect impact on various infrastructure projects in Jordan. Prior to the arrival of Syrian refugees in Jordan, the freshwater supplies to the kingdom were expected to run out around the year 2060.¹⁵² The refugee crisis also coincides with massive growth in the Jordanian population. From 1980 through 2008, the population of the state grew by an astonishing 86 percent, which is causing serious strain on the water infrastructure.¹⁵³ With the rapid surge in population due to the influx of refugees, the expectation is that Jordanian water will not last far beyond 2030.¹⁵⁴

To alleviate the stress on the water infrastructure, the government focuses on mega projects that are extremely costly and will take years to complete. The goal of the Disi Aquifer project is to meet the water needs of Jordan through 2022; however, the revised estimate anticipates the project will only meet water needs through 2016. What is particularly alarming is that the project was completed in 2013 at a cost of \$1.1 billion. Many in Jordan place the blame on the Syrian refugees for skewing demand for water and thus decreasing the effectiveness of the massive Disi Aquifer project.¹⁵⁵

Due to the increasingly desperate situation facing both refugees and Jordanians in need of water, NGOs have a critical impact in mitigating some of the water scarcity issues faced by the refugees. NGOs are often able to fill the void left by inadequate government services and infrastructure. Furthermore, they have access to resources and expertise specifically designed to address pressing issues that cannot be resolved through the use of indigenous enterprise. Despite the widely recognized vital role of NGOs in

¹⁵² Mercy Corps, *Tapped Out*, 13.

¹⁵³ *Ibid.*, 14.

¹⁵⁴ *Ibid.*, 15.

¹⁵⁵ *Ibid.*, 14.

providing services, they face structural constraints that have created more social and political divisions as well as impeding their effectiveness. The main obstacle for NGOs providing aid in Jordan is the intertwining of longstanding and broad ranging social and political grievances, particularly those pertaining to water availability, and that the humanitarian relief is targeted at the Syrian refugees.

The first structural issue that NGOs in Jordan must deal with is what the state views as its legal obligations to the refugees. Jordan is not a signatory of the 1951 UN Convention Relating to the Status of Refugees, nor the follow-on 1967 protocol.¹⁵⁶ The only agreement the Jordanian government has with the UNHCR is a 1998 memorandum of understanding, which specifically outlines the state's policies to all non-Palestinian refugees.¹⁵⁷ This agreement, while a step in the right direction, has no legal basis to hold Jordan accountable for its policies toward refugees within its borders.¹⁵⁸ In essence, it depicts the best-case scenario for Jordanian refugee policy to provide any type of aid from those fleeing persecution in their home country. The lack of a legally binding agreement and recent decisions to curtail services provided to Syrians, combined with attempts at controlling their movement by confining refugees to camps, has severely strained the relationship between the UNHCR and the Jordanian government.¹⁵⁹

The next structural issue that NGOs must face when operating in Jordan is the newly proposed laws that make establishing local NGO aid organizations in Jordan significantly more difficult. In addition, they will add more administrative red tape for local and international NGOs in accepting donations. The International Center for Not-for-Profit Law outlines the challenges:

The draft, if enacted, will significantly restrict the legal environment for NGOs in Jordan, among other constraints, the draft requires at least 50 founders to establish an NGO, provides the government with broad discretion to dissolve an NGO, imposes new requirements on branch

¹⁵⁶ Alexandra Francis, *Jordan's Refugee Crisis* (Washington, DC: Carnegie Endowment for International Peace, 2015), <http://carnegieendowment.org/2015/09/21/jordan-s-refugee-crisis/ihwc>, 6.

¹⁵⁷ Ibid.

¹⁵⁸ Ibid.

¹⁵⁹ Ibid., 4.

offices of international NGOs, and places new restrictions on the foreign funding of Jordanian NGOs.¹⁶⁰

Whether or not these proposed changes are legislated, there is a clear political undercurrent that seeks to restrict the actions of NGOs within Jordan, which would ultimately detract from the aid received by refugees.

Evidence of the Jordanian government's waning hospitality is abundantly clear and perhaps best exemplified by the October 2014 closing of the Syrian border.¹⁶¹ Approximately 5,000 refugees were stranded in the Syrian desert while the border was unofficially closed. Moreover, aid agencies were prevented by Jordanian security forces from reaching the area of the border crossing to provide aid to Syrians stranded at the border. Even more concerning are the reports of refugees being turned away at the border before having the opportunity to register with the UNHCR. The lowest estimate claims 45 percent of refugees have been turned away while the highest estimates claim 80 percent.¹⁶² What is clear from the proposed changes to NGO laws within Jordan and actions taken along the border is that the political and economic support Jordan has received is insufficient to cope with the effects of the crisis.¹⁶³

Within these structural constraints, NGOs encounter serious issues delivering targeted aid to Syrian refugees, particularly aid pertaining to water. Many efforts to provide relief, specifically to refugees, have backfired and caused serious resentment toward both NGOs and refugees. The northern governorates are witnessing the most virulent reactions to the decline of resources. In Mafraq and across northern Jordan, the availability of water to the local population has been significantly reduced to compensate for the increasing population of Zataari refugee camp.¹⁶⁴ Furthermore, since 84 percent of refugees do not live in camps, but are overwhelmingly located in the northern areas of Jordan, those communities are not only seeing their municipal water sources tapped to

¹⁶⁰ International Center for Not-for-Profit Law, "NGO Law Monitor: Jordan," last updated March 22, 2016, <http://www.icnl.org/research/monitor/jordan.html>.

¹⁶¹ Francis, *Jordan's Refugee Crisis*, 22.

¹⁶² *Ibid.*

¹⁶³ *Ibid.*, 5.

¹⁶⁴ Warrick, "Influx of Syrian Refugees."

help the refugee camp, but the refugees are also directly drawing from their community resources.¹⁶⁵

Further compounding the issue of water availability is the role that NGOs play in distorting the local market value of water in Jordan. There are many NGOs as well as Jordanians vying to use the municipal wells, but the NGO services are almost completely directed to meeting the needs of refugees. In conjunction with competing with the local population for water, the NGOs also face some level of competition between themselves, regardless of services provided. Jonathan Glennie explains that

the constant competition between NGOs for a limited pot of resources is most easily seen in applications for grand money from the major donors. Explicitly competitive tenders attract bids from dozens of NGOs, only one or two will get anything.¹⁶⁶

The end result is that NGOs willing and able to pay more can purchase more water and provide aid to larger numbers of refugees. However, the consequence is that by overpaying for water from a local source, some NGOs have priced water above what Jordanians are able to afford. This feeds into the perception that Jordanians are overlooked while all of the state's resources are directed at the refugees.¹⁶⁷

Situations like these perpetuate the perception that Syrians are given an unlimited amount of Jordanian water to use, whereas many of the poor communities hosting refugees or communities close to Zataari have lived in water stressed conditions for many years. These water issues play into other refugee tensions, such as increasing housing costs, cheap labor flooding the workforce, and clashing cultures between the refugees and the host communities. The unfortunate consequence is that many Jordanians are feeling significant effects from the refugees; therefore, they have less sympathy for the

¹⁶⁵ Francis, *Jordan's Refugee Crisis*, 1; UNHCR, "Syria Regional Refugee Response."

¹⁶⁶ Jonathan Glennie, "NGOs Need a Third Way: Collaboration," *Poverty Matters Blog*, March 13, 2012, <https://www.theguardian.com/global-development/poverty-matters/2012/mar/13/ngos-need-third-way-collaboration>.

¹⁶⁷ Mercy Corps, *Tapped Out*, 24.

humanitarian needs of the Syrians because their own situation is rapidly deteriorating, especially among the more impoverished host communities.¹⁶⁸

The tensions have escalated to the point that at least one isolated attack against an NGO providing aid strictly to refugees has occurred. Several aspects of the attack demonstrate how deep the divisions have become between Jordanians, refugees, and NGOs. Perhaps even more concerning is the type of organization attacked by local Jordanians. Warehouses owned by the Islamic Society were attacked by young Jordanian men in 2012 because the aid provided by this NGO is directed completely toward Syrian refugees. Perhaps even more critical is that this NGO is indigenous to Jordan and is an outwardly Muslim organization. The attack against the Islamic Society NGO underscores the breakdowns within Jordanian society due to the lack of resources. Alexandra Francis describes a government that is

stretched beyond its capacity to deliver essential services like healthcare, education, and waste management in the municipalities most affected by the Syrian refugee crisis...Jordanian citizens place increasing blame not just on Syrian refugees but also on the government for service delivery failures.¹⁶⁹

The severity of the problem reached a peak in 2013 when a small village in northern Jordan actually ran out of water. A wave of protests began and eventually led to the blocking of a major highway by the residents demanding water at decent prices. The protests resulted in a personal appearance from King Abdullah II with vows to rectify the problem, which diffused the demonstrations.¹⁷⁰

When coupled with more frequent protests for water, the increased level of vigilantism displayed by the Jordanian citizens presents another challenge for the kingdom. Mercy Corps initiatives to dig new pipelines have been targeted by groups of armed Jordanians because of the false perception that the projects will divert water away from local communities to refugees. In addition, death threats against those working on

¹⁶⁸ Mercy Corps, *Analysis of Host Community-Refugee Tensions in Mafraq, Jordan* (Portland, OR: Mercy Corps, 2012), <http://www.alnap.org/resource/8676>, 6.

¹⁶⁹ Francis, *Jordan's Refugee Crisis*, 8.

¹⁷⁰ *Ibid.*, 18.

the projects are common, as are hasty negotiations with officials from the water utility promising priority to the assailant's village or neighborhood. The likelihood of actual changes to the local water infrastructure to benefit these armed groups is extremely small, which means officials are simply bargaining for more time to complete their projects, similar to the king's methods for ending protests for water in northern Jordan.¹⁷¹

Another source of political contention threatening Jordan is how the increased competition for resources and water due to the Syrian refugee crisis has inflamed political divides among Jordanians.¹⁷² Some of the most powerful stakeholders in Jordanian society are rural landowners and elites who have been a traditional source of support for the monarchy. Most of the rural support for the king is a result of preferential treatment for resources, and an important one is water.¹⁷³ With the growing presence of NGOs in the state purchasing water above market value prices and delivering it to the Syrians, rural landowners are experiencing fierce competition for the remaining resources and disenfranchisement from the state. The Jordanian government is not only facing a humanitarian crisis, which is expediting a water crisis, but also a legitimacy crisis. This, in conjunction with the state's inability to meet the needs of both destitute Jordanians and Syrian refugees, presents a dire vision of the future.¹⁷⁴

Destabilizing divisions among society are not limited only to Jordanians. Distinct societal rifts, some in relation to water, are starting to become prevalent within the Syrian refugee population, which has the potential to create another non-traditional security threat for Jordan if order cannot be maintained within a large swath of the population residing on Jordanian land. Traditional family roles are changing in the refugee population; this has sparked an increase in gender-based violence between Syrians and Jordanians as well.¹⁷⁵ These issues certainly have the capability deteriorate the humanitarian crisis, spread social unrest, and potentially lead to violence in Jordan.

¹⁷¹ Mercy Corps, *Tapped Out*, 33.

¹⁷² Francis, *Jordan's Refugee Crisis*, 19.

¹⁷³ Greenwood, "Water Insecurity," 142.

¹⁷⁴ Francis, *Jordan's Refugee Crisis*, 19.

¹⁷⁵ Mercy Corps, *Analysis of Host Community-Refugee Tensions*, 6.

Water plays a critical role in defining gender roles in Syrian culture. Women are traditionally viewed as the keepers of the home and are subsequently responsible for managing many of the resources needed to sustain a family and a functioning household. These culturally defined roles are no longer feasible due to the severe water shortage in Jordan. Despite the severity of the water shortages in Jordan, which affect citizens and refugees alike, if a refugee household runs out of water, it is still often viewed as the fault of the women of the family. Since this cultural perception of water as the responsibility of women is prevalent, the lack of available water to refugees has been linked to increasing domestic violence levels in refugee communities inside and outside of camps.¹⁷⁶

Syrian refugees living in host communities, specifically, have several other factors to contend with that are degrading the fabric holding their society together. Since the opening of Zataari refugee camp, the overwhelming majority of aid is focused at the refugees living in the confines of that camp. Aid directed at those refugees living in host communities has declined significantly, whether deliveries of food, water, or other necessary supplies. The declining availability of aid for refugees living in host communities has a dramatic effect on households, and women in particular, because that support is necessary to maintain the norms of Syrian family life. With only a fraction of the aid available to refugees living outside camps, familial and cultural divisions will potentially escalate, further destabilizing a growing population within Jordan.¹⁷⁷

Less refugee aid for those living in host communities has also exacerbated tensions between Syrians and Jordanians, which has been detrimental to societal norms and has made maintaining order more difficult in Jordan. In addition to attacks on NGOs providing services for refugees and infrastructure projects perceived only to benefit Syrians, harassment directed at refugees is becoming more common in host communities.¹⁷⁸ Harassment is frequently directed at women and girls while out in public. Unfortunately, they are often forced into these situations because of basic need for water. Many Jordanian landlords refuse Syrians access to water infrastructure on their

¹⁷⁶ Mercy Corps, *Tapped Out*, 18.

¹⁷⁷ Mercy Corps, *Analysis of Host Community-Refugee Tensions*, 4.

¹⁷⁸ *Ibid.*, 6.

property; however, in Syrian culture women are still viewed as responsible for water and other basic resources in the home. The situation is sufficiently bad to garner the attention of the deputy governor of Mafraq. In a recent interview with Mercy Corps, he postulated that there is a distinct lack of respect between host communities and Syrians and that he anticipates the severity of harassment to increase, further isolating the Syrian community in Jordan.¹⁷⁹

The implications of societal breakdowns among Syrians have potentially far-reaching effects throughout Jordan. Most of the international attention and support is directed at those refugees living within the confines of a camp; however, as the situation continues to worsen for those in host communities, there is the potential to scrutinize actions of Jordan toward a particular subset of refugees. Moreover, this would place the Jordanian government in a precarious position between the international community and the Jordanian population. As resentment aimed at refugees builds in Jordan, more severe actions directed at refugees will likely take place. This will put the Jordanian government at odds with not only the UNHCR, but also with the entire community of international donors seeking to help the refugees, creating an untenable situation in which the government will essentially have to make a choice whether to appease the international or local community.

Perhaps an even greater threat to Jordan is the potential for increasing radicalization among the refugee population galvanized by issues surrounding water. Mercy Corps discovered that one of the most powerful motivating factors cited by those leaving Jordan to fight in Syria are reports of heinous crimes committed against Sunni women.¹⁸⁰ Though this example pertains to Jordanians leaving to fight in Syria, there is significant potential for this same effect to happen in Syrian refugee communities in Jordan since it is anticipated that harassment of Syrian women in Jordan will continue to escalate. These issues play into the larger threat to legitimacy facing the Jordanian government. The inability to stop the targeting of Syrian women by Jordanians and

¹⁷⁹ Ibid.

¹⁸⁰ Mercy Corps, "From Jordan to Jihad: The Lure of Syria's Violent Extremist Groups," accessed June 3, 2016, unhcr.org/syrianrefugees/download.php%3Fid%3D9810+&cd=1&hl=en&ct=clnk&gl=us&client=safari, 3.

further damaging cultural norms may have potentially radicalizing effects on the Syrian refugee population, all of which is linked to the inability of the state to provide basic resources to the population.

The Syrian refugee crisis and its impact on water in Jordan is a significant non-traditional security threat to the state. The infrastructure is stretched beyond capacity and can no longer provide adequate services to refugees or citizens. NGOs are providing aid targeted at the refugees, but they are largely neglecting the already water scarce Jordanian population, which creates subsequent problems within Jordanian society. These have led to serious political problems for the government to rectify; however, the government has primarily engaged in delaying tactics with no sustainable solutions in sight. The end result is a serious degradation of the societal norms holding Syrian families together, norms largely revolving around basic household resources, such as water. The government of Jordan runs the risk of lacking legitimacy in the eyes of refugees, Jordanians, and the greater international community if constructive solutions are implemented in a timely fashion. Perhaps the greater challenge for the Jordanian state in dealing with the Syrian refugees is to prevent the same scenario that has occurred in Syria from happening in Jordan.

V. CONCLUSION

The lack of water availability in Lebanon and Jordan is a vital non-traditional security threat compounded by the presence of large refugee populations in both countries. This threat has existed for many years in both states, but the Syrian refugee crisis brings the issue of water availability to the forefront. Despite the knowledge that water availability is a critical problem, the management and governance of this resource has lagged behind in terms of the development of effective water policies and robust national infrastructure. There are many similarities to be drawn between Lebanon and Jordan as to why there is limited development, but the differences between the two exemplify the long-term consequences for both states.

The critical issue facing Lebanon's inadequate infrastructure and management is one of resources. The state simply does not have the capital to pay for large-scale infrastructure projects or substantial improvements to the network as it exists today. The root of this issue dates back to Ottoman law that defines water as a public good, which effectively has negated the Lebanese government's efforts to privatize the water sector and earn revenue off the delivery of services to the people. The lack of revenue generated in the water sector has stifled further private investment and the government is unwilling to fund major projects because of their inability to turn a profit; therefore, the water sector will continue to deteriorate, especially due to the increasing strain on resources due to the large refugee population in Lebanon.

Another aspect negatively affecting Lebanon's water sector is the deflection of responsibility for water availability by the state due to the Israeli invasion in 1982. The occupation of southern Lebanon following the war led to the development of the water divergence theory, which proffers that Israel was diverting a substantial amount of water from the Yarmouk River back into Israeli territory. Furthermore, there are many conflicting reports from both Israeli and Lebanese government sources that make determining the validity of the claim nearly impossible. Despite the lack of consensus around the evidence, it provides a clear political opening for the Lebanese government to abdicate some responsibility for the state of water availability. Also, discussion of the

theory by government officials continue to give it legitimacy and keep it in the public consciousness, which helps to maintain the perception that the current situation is not the fault of the Lebanese government but the result of external influence.

The end result of the lack of government accountability for providing clean water is that both Lebanese and refugees lack clean water and sanitation, particularly in key host communities. Moreover, skin diseases and waterborne illnesses are on the rise in the most concentrated refugee communities. The potential for disease to spread is a significant threat to not only the refugees but also to these communities. Given a large enough outbreak of disease, societal norms could continue to break down in host communities, which would create more animosity between Lebanese and refugees. Coupled with the government's inability to provide clean water, the outbreak of disease could further delegitimize the role of government, since it would not have the capacity to combat a widespread health hazard.

The Lebanese government has limited capacity to rectify such significant challenges of water availability and quality throughout the state, since it has minimal resources to direct at the problem. Due to this, the burden for allocating resources often falls on local communities, NGOs, and non-state actors, such as Hezbollah. The inability of the government to aid the citizens may seriously decrease its legitimacy for the people of Lebanon and also the Syrian refugees. Furthermore, the potential for sectarian violence has dramatically increased because the balance of sects within Lebanon has shifted toward the Sunni and away from the Shi'a plurality, which had existed prior to the refugee crisis. Deteriorating relations between host communities and refugees may foster increased radicalization among the more desperate refugees, especially those residing in southern Lebanon because that is primarily Hezbollah controlled territory.

In Jordan, the issue of water availability is closely linked to political clout for rural elites, the most steadfast supporters of the king. These landed elites are able to use immense amounts of water for economically inefficient agricultural endeavors without paying a fraction of the cost that normal Jordanian citizens would face. Essentially, the government ensures support by not enforcing the water rationing or taxation policies on this political bloc. Furthermore, the Jordanian people have lived with water rationing for

decades, despite the financing of several mega-projects designed to drastically increase water availability throughout the kingdom. The end result is that the selective enforcement of water policy by the Jordanian government leaves no effective framework for the regulation of water throughout the state, including for citizens and refugees. This schizophrenic state of water policy enforcement in Jordan indicates a sense of denial about the severity of the crisis facing the state; significant revenues that could be used to improve water delivery throughout the state are not collected in order to maintain the political status quo.

Another factor affecting the management of water in Jordan is the 1994 peace treaty with Israel. One of the main issues addressed in the treaty is the equitable usage of water from sources shared between Jordan and Israel. Though this agreement was framed as a great victory for Jordan, the reality of the treaty is that few agreements were actually made and the majority of the treaty involved vague metrics that did not set limits on extraction. No enforcement mechanisms were created to change the status quo and balance the amount of water used by both Israel and Jordan, making the agreement toothless.

The situation facing Jordan is unsustainable in the long term, yet there is minimal political will for significant change to the current state of affairs in the water sector. For meaningful reform to take place, the rural elites would have to succumb to the same water rationing and taxation as the regular population; this would have a significant financial impact on their agricultural operations. The treaty of 1994 would have to be revisited by Jordan and Israel to create real mechanisms to ensure resource sharing is equitable. Each of these steps would require the king to expend significant political capital, not only with the rural landowners, but also with a neighboring state that has no will to change the current agreement in any way.

The current perception of refugees in Jordan has shifted from a group of people requiring help to a group of people draining the state of precious few resources. Increasingly hostile actions, mostly from young Jordanian men, are directed at the refugees. Syrian women are frequently the target of these actions and their public harassment is creating familial tensions within refugee communities. Since Syrian

women are traditionally the managers of family resources like food and water, the actions of Jordanians aimed at them has restricted their ability to access water for their families. In turn, this has contributed to an increase in domestic violence rates among refugees in Jordan. Furthermore, as the societal norms in refugee communities break down, the potential for radicalization may increase, causing yet another threat for the rule of law in Jordan.

Another aspect of the refugee crisis that threatens Jordan is that citizens are taking matters into their own hands, which delegitimizes the government's role in providing public services and security to the population. Young men have attacked Jordanian-based Islamic NGOs providing aid to refugees in an effort to stop the delivery of services. State-run infrastructure projects have also been the target of hostile actions from Jordanian citizens. Because they are largely seen as projects to help only the refugees, groups of armed men have interrupted work on new water pipelines and have only allowed work to continue if the workers promise to help their local villages as well. Furthermore, the lack of water has led to protests that have shut down major roads and highways, which have resulted in direct intervention by the king for resolution. Unfortunately, the promises made are most likely delaying tactics to placate the population until another crisis arises.

Both Lebanon and Jordan have many similarities and several key differences that create differing prospects for the future of both states. Water is viewed as a public good in Lebanon, regardless of citizenship, and this has precluded effective development of water infrastructure because of its lack of profitability. Jordan does not view water as a public good, but it selectively chooses to enforce revenue collection for citizens who are not members of the political power base. Both states have limited finances to dramatically develop their water sectors, yet Jordan has chosen to finance several mega-projects, albeit with minimal impact, to create the appearance of proactive solutions to the inevitable water crisis looming in the future. Finally, the capacity of the state is perhaps the most critical aspect in dealing with the refugee crisis and water availability. Lebanon's government has almost no capacity to handle the needs of refugees or its citizens, but non-state actors and local networks have largely filled those roles. Political

chaos is the norm in Lebanon and the refugees are simply another challenge for the Lebanese people to overcome to achieve stability. In Jordan, the government is losing its grasp on the situation, which may delegitimize state institutions. Since the capacity is higher in Jordan to cope with the refugees, the state has much more to lose in the eyes its citizens, the refugees, and the international community if the situation continues to deteriorate.

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF REFERENCES

- Abouzeid, Rania. "Jordan's Rural Chafe under the Burden of Hosting Syrian Refugees." *Al Jazeera*, October 21, 2013.
<http://america.aljazeera.com/articles/2013/10/21/jordana-s-rural-poorchafeundertheburdenofhostingsyrianrefugees.html>.
- Al-Harahsheh, Sura, Rida Al-Adamat, Seraj Abdullah. "The Impact of Za'atari Refugee Camp on the Water Quality in Amman-Zarqa Basin." *Journal of Environmental Protection* 6, no. 1 (2015): 16–24.
http://file.scirp.org/pdf/JEP_2015011510265820.pdf.
- Allan, John A. "Hydro-peace in the Middle East: Why No Water Wars?: A Case Study of the Jordan River Basin." *Sais Review* 22, no. 2 (2002): 255–272.
https://muse.jhu.edu/journals/sais_review/v022/22.2allan.html.
- Allan, John A., and Tony Allan. *The Middle East Water Question: Hydropolitics and the Global Economy*. London: I. B. Tauris & Co, 2001.
- Amery, Hussein A. "A Popular Theory of Water Diversion from Lebanon: Toward Public Participation for Peace." In *Water in the Middle East: A Geography of Peace*, edited by Hussein A. Amery and Aaron T. Wolf, 121–149. Austin, TX: University of Texas Press, 2010.
- Catafago, Selim. "Restructuring Water Sector in Lebanon: Litani River Authority-Facing the Challenges of Good Water Governance." In *Food Security under Water Scarcity in Méditerranéennes: Série A. Séminaires Méditerranéens*, edited by Rosella Monti, 75–93. Paris: CIHEAM, 2005.
<https://om.ciheam.org/om/pdf/a65/05002197.pdf>.
- Chartres, Colin, Mark Giordano, and Samyuktha Varma. "Water: A Free Public Good or a Market Commodity?" Global Water Forum. Last updated September 20, 2010.
<http://www.globalwaterforum.org/2010/09/20/water-a-free-public-good-or-a-market-commodity/>.
- Darwish, T., T. Atallah, M. El Moujabber, and N. Khatib. "Salinity Evolution and Crop Response to Secondary Soil Salinity in Two Agro-climatic Zones in Lebanon." *Agricultural Water Management* 78, no. 1 (2005): 152–164.
<http://www.sciencedirect.com/science/article/pii/S0378377405002337152>.
- Gebeily, Maya, and James Haines-Young. "High and Dry: Syrian Refugees Have Been Severely Affected by the Water Shortages." *Executive*. October 30, 2014.
<http://www.executive-magazine.com/economics-policy/water-high-and-dry>.

- Glennie, Jonathan. "NGOs Need a Third Way: Collaboration." *Poverty Matters Blog*, March 13, 2012. <https://www.theguardian.com/global-development/poverty-matters/2012/mar/13/ngos-need-third-way-collaboration>.
- Greenwood, Scott. "Water Insecurity, Climate Change and Governance in the Arab World." *Middle East Policy* 21, no. 2 (2014): 140–156. <http://mepc.org/journal/middle-east-policy-archives/water-insecurity-climate-change-and-governance-arab-world>.
- Gluck, Caroline. "Syrian Refugee Influx Adding to Jordan's Water Worries." OXFAM Canada. Accessed October 12, 2015. <http://www.oxfam.ca/blogs/conflict-emergencies/refugee-influx-adding-to-jordans-water-worries>.
- Fischhendler, Itay. "Ambiguity in Transboundary Environmental Dispute Resolution: The Israeli—Jordanian Water Agreement." *Journal of Peace Research* 45, no. 1 (2008): 91–109.
- Francis, Alexandra. *Jordan's Refugee Crisis*. Washington, DC: Carnegie Endowment for International Peace, 2015. <http://carnegieendowment.org/2015/09/21/jordan-s-refugee-crisis/ihwc>.
- Heslot, Soazic. "Jordan's Food and Water Security." Future Directions International. September 11, 2014. <http://www.futuredirections.org.au/publications/food-and-water-crises/1939-jordan-s-food-and-water-security.html>.
- Jacobsen, Karen. "Can Refugees Benefit the State? Refugee Resources and African Statebuilding." *Journal of Modern African Studies* 40, no. 4 (2002): 577–596.
- Khatib, Ahmad. "Syrian Refugees Draining Water-poor Jordan Dry." *Daily Star*, June 1, 2012. <http://www.dailystar.com.lb/News/Middle-East/2012/Jun-01/175355-syrian-refugees-draining-water-poor-jordan-dry.ashx>.
- Lefèvre, Raphaël. "Tackling Sunni Radicalization in Lebanon." Carnegie Middle East Center. December 24, 2014. <http://carnegie-mec.org/publications/?fa=57592>.
- Massoud, May A., Abdolmonim Al-Abady, Mey Jurdi, and Iman Nuwayhid. "The Challenges of Sustainable Access to Safe Drinking Water in Rural Areas of Developing Countries: Case of Zawtar El-Charkieh, Southern Lebanon." *Journal of Environmental Health* 72 (10): 34–30.
- Mercy Corps. *Analysis of Host Community-Refugee Tensions in Mafraq, Jordan*. Portland, OR: Mercy Corps, 2012. <http://www.alnap.org/resource/8676>.
- . *Tapped Out: Water Scarcity and Refugee Pressures in Jordan*. Portland, OR: Mercy Corps, 2014. <https://www.mercycorps.org/research-resources/tapped-out-water-scarcity-and-refugee-pressures-jordan>.

- Michaelson, Ruth. "Refugees Pay the High Price of Lebanese Cost-cutting." *Al Jazeera*, April 30, 2015. <http://www.aljazeera.com/news/2015/04/refugees-pay-high-price-lebanese-cost-cutting-150412095256439.html>.
- Murdock, Heather. "Water Shortages in Lebanon Devastate Syrian Refugees." *Voice of America*, December 23, 2014. <http://www.voanews.com/content/water-shortages-lebanon-syrian-refugees/2571595.html>.
- Organization for Economic Co-operation and Development. *Water Governance in Jordan: Overcoming the Challenges to Private Sector Participation*. Paris: OECD Publishing, 2014. http://www.keepeek.com/Digital-Asset-Management/oecd/governance/water-service-governance-in-jordan_9789264213753-en#page1.
- Roberts, Adam. "Foreigners in Lebanon: Show Us Your Papers." *The Economist*, August 19, 2014. <http://www.economist.com/blogs/pomegranate/2014/08/foreigners-lebanon>.
- Rogers, Peter, and Peter Lydon. "Preface." In *Water in the Arab World: Perspectives and Prognoses*, edited by Peter Rogers and Peter Lydon, iii–v. Cambridge, MA: The Division of Applied Sciences, Harvard University, 1994.
- Roudi-Fahimi, Farzaneh, Liz Creel, and Roger-Mark De Souza. "Finding the Balance: Population and Water Scarcity in the Middle East and North Africa." Population Reference Bureau, Accessed July 23, 2016. <http://www.prb.org/Publications/Reports/2002/FindingtheBalancePopulationandWaterScarcityintheMiddleEastandNorthAfrica.aspx>.
- Saadallaoui, Bassem. "Competing for Scarce Resources: The New Concern for Syrian refugees and Host Communities in Lebanon." ENN. Accessed April 12, 2016. <http://www.ennonline.net/fex/48/competing>.
- Sadik, Abdul-Karim, and Shawki Barghouti. "Water Problems of the Arab World: Management of Scarce Resources." In *Water in the Arab World: Perspectives and Prognoses*, eds. Peter Rogers and Peter Lydon, 1–37. Cambridge, MA: The Division of Applied Sciences, Harvard University, 1994.
- Saleh, Kamel. "Lebanon Faces Water Crisis." *Al-Monitor*, March 30, 2014. <http://www.al-monitor.com/pulse/security/2014/03/lebanon-water-poverty-line-crisis.html#>.
- Schenker, David. "Syria's Good Neighbors: How Jordan and Lebanon Sheltered Millions of Refugees." Washington Institute, September 28, 2015. <http://www.washingtoninstitute.org/policy-analysis/view/syrias-good-neighbors-how-jordan-and-lebanon-sheltered-millions-of-refugees>.

- Schwartzstein, Peter. "Syrian Refugees in Lebanon Camp Reliant on 'Hell Water' that Reduces Metal to Rust." *The Guardian*, May 26, 2015.
<http://www.theguardian.com/global-development/2015/may/26/syrian-refugees-lebanon-shatila-camp-hell-water>.
- Shaban, Amin. "Indicators and Aspects of Hydrological Drought in Lebanon." *Water Resources Management* 23, no. 10 (2009): 1875–1891.
- Shapland, Greg. *Rivers of Discord*. New York: St. Martin's Press, 1997.
- Siddiqi, Afreen, and Laura Diaz Anadon. "The Water-Energy Nexus in Middle East and North Africa." *Energy Policy* 39, no. 8 (2011): 4529–4540.
<http://www.sciencedirect.com/science/article/pii/S0301421511003065>.
- Silverman, Amanda. "Global Thinkers: Why Water Is a Fundamental National Security Issue." *Global Thinkers. Foreign Policy Online*. November 3, 2015.
<http://foreignpolicy.com/2015/11/03/global-thinkers-why-water-is-a-fundamental-national-security-issue/>.
- Starr, Joyce R. "Water Wars." *Foreign Policy*, no. 82 (Spring 1991): 17–36. doi: 10.2307/1148639.
- Suleiman, Rebhieh, Lisa Van Well and Jan-Erik Gustafsson. "Governance of the Amman Water Utility." *Development in Practice* 18, no. 1 (2008): 53–65.
<http://www.jstor.org/stable/27751875>.
- Sweis, Rana F. "No Syrians Are Allowed into Jordan, Agencies Say." *New York Times*, October 8, 2014.
<https://www.google.com/search?client=safari&rls=en&q=Syrian+refugees+turned+away+from+Jordan&ie=UTF-8&oe=UTF-8#q=Syrian+refugees+turned+away+from+Jordan&start=10>.
- United Nations Economic Commission for Europe. *Guidebook on Promoting Good Governance in Public-Private Partnerships*. Geneva: United Nations, 2008.
<http://www.unece.org/fileadmin/DAM/ceci/publications/ppp.pdf>.
- United Nations High Commissioner for Refugees. *Support to Lebanese Host Communities and Public Institutions: Under the Sixth Regional Response Plan (RRP6-2014)*. New York: UNHCR, 2014.
- . *WASH Assessment of Syrian Refugee Households in Akkar Governorate*. New York: UNHCR, 2014. http://www.reachresourcecentre.info/system/files/resource-documents/reach_lbn_akkar_report_washhouseholdassessmentakkar_dec2014_1.pdf.

- Vengosh, Avner, and Eliahu Rosenthal. "Saline Groundwater in Israel: Its Bearing on the Water Crisis in the Country." *Journal of Hydrology* 156, no. 1 (1994): 389–430. <http://www.sciencedirect.com/science/article/pii/0022169494900876>.
- Wang, Yizhou. *Defining Non-traditional Security and Its Implications for China*. Beijing: Institute of World Economics and Politics, Chinese Academy of Social Sciences, 2004. <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.472.3779&rep=rep1&type=pdf>.
- Warrick, Joby. "Influx of Syrian Refugees Stretches Jordan's Water Resources even More Thinly." *Washington Post*, June 16, 2013. https://www.washingtonpost.com/world/national-security/influx-of-syrian-refugees-stretches-jordans-water-resources-even-thinner/2013/06/15/5178a978-d2c6-11e2-a73e-826d299ff459_story.html.
- Yamout, Ghina, and Dima Jamali. "A Critical Assessment of a Proposed Public Private Partnership (PPP) for the Management of Water Services in Lebanon." *Water Resources Management* 21, no. 3 (2007): 611–634. <http://link.springer.com/article/10.1007/s11269-006-9033-3>.

THIS PAGE INTENTIONALLY LEFT BLANK

INITIAL DISTRIBUTION LIST

1. Defense Technical Information Center
Ft. Belvoir, Virginia
2. Dudley Knox Library
Naval Postgraduate School
Monterey, California