

# *Master of Military Studies Requirements for the Degree*

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Marine Corps Combat Development Command  
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## MASTER OF MILITARY STUDIES

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### **Leveraging Water Scarcity to Pursue U.S. Foreign Policy Objectives**

SUBMITTED IN PARTIAL FULFILLMENT  
OF THE REQUIREMENTS FOR THE DEGREE OF  
MASTER OF MILITARY STUDIES

**Major Ronnie L. Goode II**

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# *Master of Military Studies Requirements for the Degree*

**Title:** Leveraging Water Scarcity to Pursue U.S. Foreign Policy Objectives

**Author:** Major Ronnie Goode II, United States Marine Corps

**Thesis:** The United States (U.S.) should develop a comprehensive water strategy to leverage growing water scarcity in the Middle East to alleviate regional instability and pursue US foreign policy objectives. The author will use the Tigris and Euphrates river basin as a case study to demonstrate how a strategy to lessen water scarcity could achieve positive results.

**Discussion:** The term water scarcity has now been elevated to a level on par with key terrain features and strategic resources in mainstream media. Water issues have been addressed in policy but now water scarcity problems, normally addressed as soft power, are being recognized as national security concerns for the U.S. The U.S., despite understanding the strategic importance of water scarcity and potential risk to international stability, has been slow to react and define what policy options to pursue.

There are several factors leading to a shortage of water in Iraq. The population of Iraq lives in a water scarce environment that is impacted by high birth rates leading to water demand increases. Climate change is also effecting the flow of the Tigris and Euphrates River, thus the water availability in Iraq does not keep up with population demands. Turkey's GAP project (22 dams and 19 hydroelectric plants) in the upstream Tigris-Euphrates River Basin provides Turkey total control of both rivers further enhancing Turkey's social, political and economic sway over Iraq and Syria. Iraq and Syria both claim that Turkey is withholding more than its share of water.

The U.S. has the capability and capacity to lead the world in a regional water initiative to stabilize the water crisis in Iraq. Such an initiative requires strong central leadership the President of the U.S. to accomplish this goal he should be given all the authority and budgetary allowances to coordinate across all U.S. federal agencies.

**Conclusion:** As the global leader for good, the U.S. has an opportunity to create partnerships to alleviate water shortages between multilateral international organizations, regional governments and international NGOs. The international goal of a U.S. global water campaign should be to inspire foreign government leadership to priorities on fresh water issues. Prioritization of water for drinking and sanitation will work to alleviate other concerns, such as food security, disease prevention and infant mortality rates. And while water scarcity seldom causes armed conflict, it is a driver of instability that leads to migration, urbanization, and disease. Furthermore, the U.S. in pursuit of strong policy measures to alleviate water scarcity issues in Iraq will uncover opportunities to promote U.S. interests and strengthen U.S. leadership in the Middle East.

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## *Preface*

I began the study of water scarcity out of my joy in taking my son fishing. As I expanded my question of water scarcity as a thesis topic, curiosity led me to think that the U.S. has an opportunity to leverage water to develop our goodwill and foreign policy objectives in the Middle East. My research of water scarcity has been enjoyable and has added to my professional knowledge and education in understanding the complex nature of water as a strategic resource.

I am grateful to numerous people that made it possible for me to write this paper. First, I owe thanks to God, who has taught me “I can do all things through Christ who strengthens me” (Philippians 4:13). Second, many thanks are due to my wife Krystle and our son James. They provide me with lasting support, love, and patience on a daily basis. Finally, and definitely not least, I am indebted to Doctor Matt Slater, my MMS mentor. His efforts in taking a curious idea and helping me to transform it into the topic presented in this paper were significant.

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## INTRODUCTION

Rivers must have been the guides which conducted the footsteps of the first travelers. They are the constant lure, when they flow by our doors, to distant enterprise and adventure; and, by a natural impulse, the dwellers on their banks will at length accompany their currents to the lowlands of the globe, or explore at their invitation the interior of continents.<sup>1</sup>

*(Henry David Thoreau: Week on the Concord and Merrimack Rivers)*

Water covers over 70 percent of the planet and is the most valuable natural resource, as life on this planet cannot live without it.<sup>2</sup> The composition of every living organism on Earth is dependent on water. Water resources are unfortunately neglected and mismanaged as a natural resource. People all over the world are feeling the effects of reduced access to fresh water through pollution, evaporation, and salinization. Access to fresh water has become a subject of conflict in many countries around the world.

Lack of water resources creates a distributional conflict between those that have and those that have not.<sup>3</sup> Distributional conflicts over water occur when there is a lack of water to satisfy everyone's needs and wants. Resolution of distributional conflicts inevitably creates a "win-lose" situation where one entity will gain a more favorable outcome than another entity. With water resources, some will build dams and divert rivers to solve one problem while another dispute over the same body of water will likely occur at a later time. While armed conflict over water is infrequent, shortages of water exacerbate existing problems of governmental instability and left unchecked, may lead to state failure. Water scarcity and water rights are instigators of conflict reaching back as far as 2500 BC. As of 2012, the Office of the Director of National Intelligence (ODNI) released a study in 2012 outlining that war over water today is unlikely, however, fresh water shortages will create conditions of social tensions leading to potential conflict.<sup>4</sup>

The ODNI report also found, "North Africa, the Middle East, and South Asia will face significant challenges coping with water problems."<sup>5</sup> Water scarcity combined with poverty,

social unrest, and weak political governments all combine to create social disruptions on a large enough scale to potentially involve the U.S. Lack of fresh water will have a destabilizing effect on countries not equipped with the financial or technological resources to solve their water problems. Many of the states referenced above depend on river water controlled by upstream state actors causing disputes over water rights.

While drought is a naturally occurring phenomenon, water scarcity is a fundamentally man-made problem. Water scarcity occurs when there is an overuse of water resources caused by consumption at a faster rate than nature can renew the supply. A 2013 United Nations report states that, “around 1.2 billion people or almost one-fifth of the world's population, live in areas of physical scarcity, and 500 million people are approaching this situation.”<sup>6</sup> Water resources are distributed unevenly around the world, to the extent that people must manage the resources that they have available or move to other locations. Problems arise with trans-boundary waters. Trans-boundary water is where a river or water source provides water to multiple states. Each state will have hydrological, social, and economic dependencies on their water and disruptions to their access, quality, and quantity of water will significantly affect their livelihood.

Poor agricultural practices and pollution of available water are two significant man-made drivers of water scarcity in developing countries. Water scarcity fosters competition and dispute between peoples in their desire to access fresh water. Dams, irrigation projects, and reservoirs are tempting targets for terrorists wanting to exert influence over a population.

Population growth and economic development over the next ten years will increase the energy and water demands in North Africa, the Middle East, and South Asia. These areas are largely dependent on hydropower to produce electricity. Their current shortages of water will only increase the demand for water to support power production. Water problems in these areas, if not

managed correctly, will cause a decrease in food supplies, and energy available for economic and industrial growth. Weak political systems will not be able to confront these issues in a timely enough manner to prevent social and political unrest.

Direct inter-state conflict over water is unlikely. However, using water as leverage will continue between riparian neighbors. Nations that live upstream can impede the flow of natural groundwater and use water scarcity as a means to influence nearby states. In the Middle East water is becoming increasingly scarce. Water scarcity in this area is causing social tensions and political unrest. The Tigris and Euphrates (T/E) are two important regional rivers that provide water for Turkey, Syria, and Iraq. It is in U.S. interests to develop a comprehensive water strategy to leverage growing water scarcity in the Middle East to alleviate regional instability and pursue US foreign policy objectives. The author will use the Tigris and Euphrates river basin as a case study to demonstrate how a strategy to lessen water scarcity could achieve positive results.

### **Organization of Thesis**

This thesis is organized into sections beginning with historical events, then leading through a discussion of hydro-politics, culminating in a proposed strategy for the U.S. The first section provides definitions for a clear understanding of terms and concepts. The second section provides some brief historical examples of conflict and potential conflict over water scarcity are presented to provide a basis for analysis. The following section is a recent case study of the hydro-politics in the Tigris-Euphrates River Basin. This case study will provide the reader a frame of reference for the discussion of U.S. strategy options that may be employed to alleviate conflict and pursue cooperation with regards to hydro-political issues.

## Related Concepts and Terms

This thesis will use the following definitions of key terms and concepts throughout the paper. “*Water scarcity*” refers to the volumetric abundance, or lack thereof, of water supply. Water scarcity calculated as a ratio of human water consumption to available water supply in a given area. Water scarcity is a physical, objective reality that can be measured consistently across regions and over time.<sup>7</sup> “*Water stress*” refers to the ability or lack thereof, to meet human and ecological demand for water. Compared to scarcity, “water stress” is a more inclusive and broader concept. It considers several physical aspects related to water resources, including water scarcity, but also water quality, environmental flows, and the accessibility of water. “*Water risk*” refers to the probability of an entity experiencing a deleterious water-related event. Water risk is felt differently by every sector of society and the organizations within them and thus is defined and interpreted differently (even when they experience the same degree of water scarcity or water stress). “*Riparian*” Relating to or living or located on the bank of a natural watercourse (as a river) or sometimes of a lake or a tidewater. “*Salination*” the process of increasing the salt content. “*Water rights*” a group of rights designed to protect the use and enjoyment of water that travels in streams, rivers, lakes, and ponds, gathers on the surface of the earth, or collects underground.<sup>8</sup> “*Virtual Water*” is defined as the total volume of water needed to produce and process a commodity or service.<sup>9</sup>

The amount of water available for use contributes to water scarcity. An area can be water stressed but contain large amounts of physical water, however, if water contamination is present the population will encounter tension due to the inability to use the water. Water risk is the available decisions that an organization can make with its available water resources. Given

amounts of water flow and quality an organization only has a finite quantity of water to work with and must decide how to allocate its water resources.

### **Water Scarcity and Hydro-politics**

Simply stated, hydro-politics is the politics of water (specifically fresh water) and the availability of water resources for the sustainment of life and development. The term hydro-politics first recognized in the academic literature in the book by John Waterbury, *Hydropolitics of the Nile Valley*.<sup>10</sup> Generally a domestic issue, hydro-politics, and water scarcity issues have become an international security issue when countries must share water resources. Water as a strategic natural resource, can lend itself to conflict or cooperation. Understanding how regions cooperate over perceived water rights is essential to understanding the hydro-politics of a given area.

Hydro-politics are intermingled with other issues ranging from economics to regional security. Water conflict and/or cooperation is dependent on how much scarcity impacts their available water, management of those water resources, and the historical record of water ownership. If the relationship of two countries is already marked by confrontation a dispute over water, it may cause an escalation of hostilities. A shortage of water will cause governments to pursue alternatives such as virtual water products. Hydro-politics effects social and economic structures, and while water may not be the single cause of conflict, its relation to security issues can create instability at the regional and international level.

A common dilemma in hydro-politics is caused by the sharing of water from an international river basin. This region typically can resolve water scarcity through cooperation and water

sharing policies. However, when the upstream country controls the source of water, and the downstream countries perceive a reduction below their needs a complex problem comprised of political, economic, environmental, and security issues will arise. Geography plays a large role in the security aspect of hydro-politics where state sovereignty and international rivers do not follow the same rules. Water scarcity may create a conflict, cooperation, or coordinated effort in international river basins.

Water scarcity and hydro-politics play a significant role in study of conflict analysis and interpretation. Academic circles debate if conflict or cooperation occurs more often over water resources. Hydro-politics is a larger view of relationships in national and regional security matters. Understanding the hydro-politics of a particular region does not necessarily mean that there will be conflict or cooperation. Studying hydro-politics through the security studies lens enables the observer to recognize the importance of water in the pursuit of foreign policy objectives. Hydro-politics and the ability to resolve and manage water scarcity is an important facet of international security.

### **Water Scarcity and Conflict**

The Nile River Basin is an excellent example of a nation state controlling the flow of water to its neighbors. The Nile River basin flows through ten countries in northeastern Africa; the hydro politics of this area has far reaching ramifications for national and international relations. Some individuals in Egypt state that they have a natural, historic right to the water flow of the Nile River. Egypt proclaims that any perceived reduction of the supply of water from the Nile could create conditions for them to go to war.

The Jordan River Valley conflicts over water culminated in the 1967 Six-Day War according to many including the former Israeli Prime Minister Ariel Sharon.<sup>11, 12</sup> With its beginnings starting from clashes between Israel, Jordan, and Syria over the flow of the Jordan River. At the war's end, Israel, as the victor was able to seize Golan Heights encompassing the entire Jordan River basin. This in turn led to Palestinian claims that they do not have access to their geographic natural source of water and are forced to buy water from Israel at inflated prices.

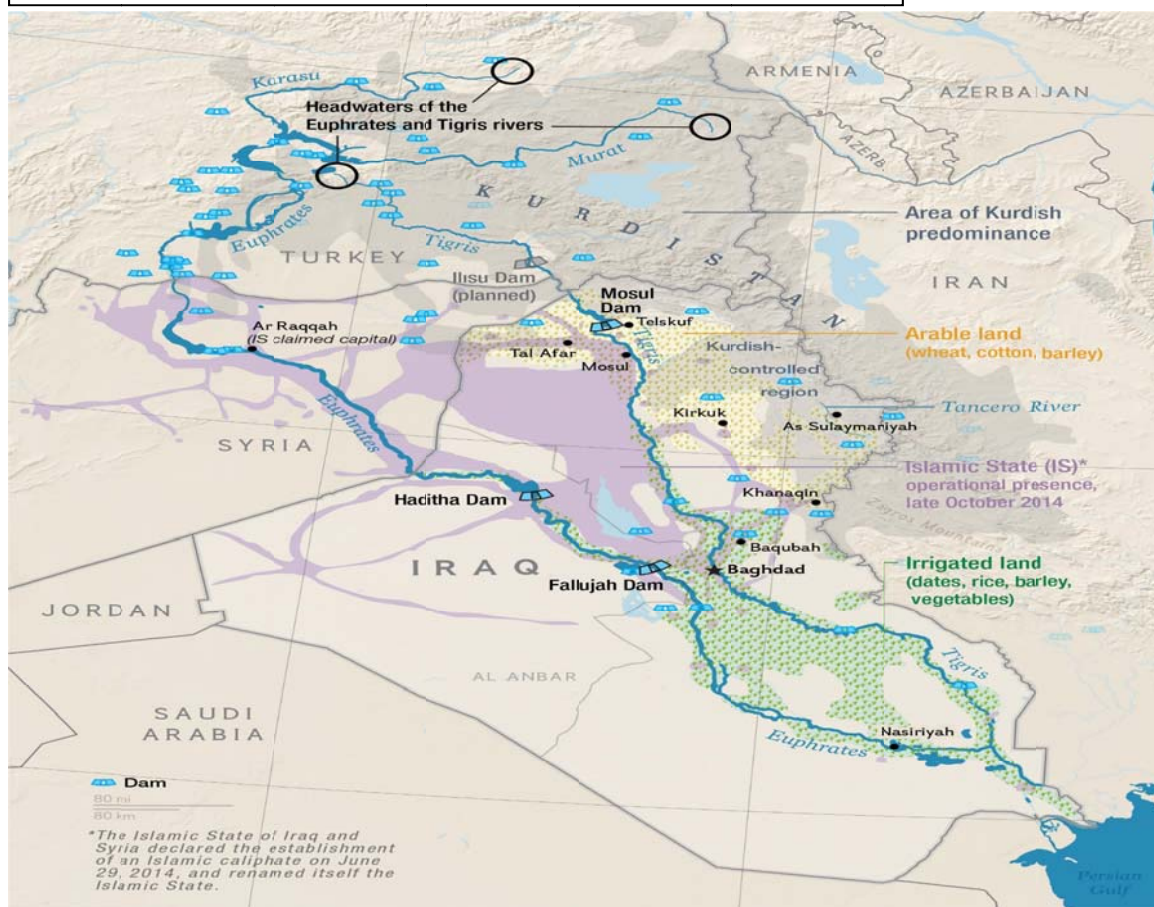
The Tibetan plateau is one of the largest concentrations of freshwater after the Arctic and Antarctic. Out of the Tibetan Plateau flow the Yellow River, Yangtze, Mekong, and Brahmaputra Rivers. China with severe water shortages due to pollution is working to create a South-North Water Diversion Project that will have serious water consequences for India and Vietnam<sup>13</sup>.

The Islamic State of Iraq and the Levant (ISIL) has successfully effected the lives of millions of people through targeting and acquiring control of water resources. ISIS correctly identified that control over water and energy resources in the arid regions of Iraq and Syria means control of the people and leverage over the government. When ISIS captured the Mosul Dam the U.S. stepped up airstrikes to aid, Kurdish fighters retake the key water and power source. ISIS again tried to obtain Haditha and had they been successful they would have controlled the Euphrates River. Any rogue group of non-state actors may take note of how ISIS has controlled water and choose to emulate it as a coercive tactic.<sup>14</sup>

## **CASE STUDY OF THE TIGRIS-EUPHRATES RIVER BASIN**

The Tigris and Euphrates River headwaters begin in eastern Turkey and travel southeast through northern Syria and into Iraq (see Figure 1). The Tigris is 1200 miles long and starts in the Taurus Mountains of eastern Turkey and then flows southeast along the Syrian and Turkish border entering Iraq. Once in Iraq the Tigris is fed by several main tributaries originating in Turkey and the mountainous region in Iran. The Euphrates is 1740 miles long and begins on the Anatolian Plateau in Turkey and flows southward through Syria and Iraq. Like the Tigris, the Euphrates is fed by tributaries originating in Turkey.<sup>15</sup>

**Figure 1: Map inset depicting Tigris-Euphrates River Basin**



Source: National Geographic website

<http://news.nationalgeographic.com/news/2014/11/141104-iraq-water-crisis-turkey-iran-isis/>

Downloaded December 11, 2014

Early civilizations rose to power in the Tigris-Euphrates River base due to early governments' ability to control the water resources provided by the two rivers. History discusses the Hanging Gardens of Babylon and the immense canal systems that were used to support irrigation efforts in that region. Those ancient governments understood that water in that area was a strategic resource mandatory for their way of life and survival. Protecting their supply and access to water was a security issue for historical Mesopotamian culture, and continues to be one for modern day Turkey, Iraq, and Syria. These riparian neighbors, specifically Iraq and Syria have unequal access to the Tigris-Euphrates River water resources. In this upstream and downstream interaction, each nation views access to water in accordance with their relationship as riparian neighbors.

The Tigris and Euphrates Rivers are essential for providing economic activities in Turkey, Syria, and Iraq. From farming to hydroelectric power these rivers supply water to all manner of the workforce. Turkey in the 1960s began a project called the Southern Anatolian Project (GAP-Turkish acronym) is one of the largest river basin development projects in the world and the largest single development project carried out by Turkey.

GAP includes 13 irrigation and hydropower schemes, involving the construction of 22 dams and 19 hydroelectric power plants on both the Tigris and the Euphrates. Upon completion, it is expected to provide up to 25 percent of the country's electricity.<sup>16</sup> While a definite economic decision by Turkey, GAP has alienated its neighbors Syria and Iraq with regards to hydro-politics.

Iraqi and Syrian resource requirements for water grow but their access to water is diminished due to GAP. Estimations of the disruption of water by GAP dams will reduce Syrian availability to water by 40 percent and in Iraq upwards of 80 percent. Completion of GAP has negatively

affected the regional stability in the area. Syrian tension over GAP has manifested itself in Syria supporting the Kurdistan Worker's Party (PKK) who has conducted guerrilla warfare against the Turkish government.<sup>17</sup>

Iraq and Turkey continue to dispute the ramifications of the GAP project. The reduced flow of water has caused Iraq's water minister to travel to Ankara, Turkey numerous times to ask for an increase in water flow. Iraq as a downstream country receives their drinking, agriculture, and electricity from the resources flowing upstream. Iraq's position is that any mismanagement of water resources by Turkey will adversely affect their livelihood.<sup>18</sup>

Turkey declares that the Tigris and Euphrates rivers are trans-boundary and Turkey has control over the waterways that are inside of Turkish borders. Turkish politicians look at their ability to control water the same as Syria and Iraq can control their natural resources. Suleyman Demirel (President of Turkey at 1992 dedication of the Ataturk Dam) stated, "Neither Syria nor Iraq can lay claim to Turkey's rivers any more than Ankara could claim their oil...The water resources are Turkey's, the oil resources are theirs. We don't say we share their oil resources, and they can't say they share our water resources."<sup>19</sup>

In addition to asserting their rights to the Tigris and Euphrates rivers, Turkish officials will point to Iraq's mismanagement of water under the Saddam Hussein regime and continued waste of water due to poor agricultural practices. Turkey desires to see that Iraq commits to improving their capability to manage water more efficiently before Iraq requests more water from Turkey.<sup>20</sup>

The Tigris-Euphrates River Basin water disputes will not be solved by discussions and written treatise. Neither Syria nor Iraq are likely to go to war over water availability. However, they may continue subversive behavior by lending support to the Kurdish population. This creates tensions and security issues in the region that could potentially cause the U.S. to intervene. At the

individual state level, Iraq and Syria must effectively manage their water resources to meet demands. This begins with the collection of current supply quantities and forecasting current and future demand.

The populations of Turkey, Syria, and Iraq are all increasing. With population growth the demand for fresh water will grow as well. Water scarcity in Iraq is going to become progressively more severe. The U.S. with Turkey, Iraq, and Syria has an opportunity to take action to provide some resolution to Iraq's water scarcity issues. If not addressed Iraq's water scarcity will increase regional tensions possibly leading to conflict in the future.

### **Water Scarcity and National Security**

Water competition, water scarcity, and water rights in the Middle East create growing security threats that the U.S. will eventually need to face. In March 2013, Director of National Intelligence James Clapper wrote to the Senate Select Committee on Intelligence that “competition and scarcity involving natural resources was a threat on par with global terrorism, cyberwar, and nuclear proliferations.”<sup>21</sup> Iraq is “further stressed by heavy dependence on river water controlled by upstream nations with unresolved water-sharing issues.”<sup>22</sup> Iraq's lack of fresh water is a destabilizing factor, and currently Iraq does not have the management ability, financial and technical ability to solve their water problems.

Taken from the U.S. Intelligence Community's Global Water Security report,

Water shortages, poor water quality, and floods by themselves are unlikely to result in state failure in the next ten years. However, water problems – when combined with poverty, social tensions, environmental degradation, ineffectual leadership, and weak political institutions – contribute to social disruptions that can result in state failure...as water shortages become more acute beyond the next 10 years, water in shared basins will increasingly be used as

leverage; the use of water as a weapon or to further terrorist objectives will also become more likely.<sup>23</sup>

By 2025, fully 1.8 billion people will live in countries or regions with absolute water scarcity, with almost half of the world living in conditions of water stress.<sup>24</sup> In the Tigris and Euphrates river basin, water has been a source of political strain for hundreds of years. Much of Iraq's water for drinking, sanitation, and irrigation comes from the Tigris and Euphrates rivers. Current ten to twenty-year population projections place supply of water not meeting the future demands in Iraq. The government of Iraq will be challenged significantly to solve the needs of its community.

Depleted groundwater used for agriculture, which accounts for 70 percent of water usage, could destabilize markets and contribute to price swings such as those in 2011 that drove food costs up and created unrest in the Middle East.<sup>25</sup> Water is a critical security issue for Iraq. Instability and tensions will rise and create conditions where countries may not work with the U.S. on foreign policy items.

### **Drivers of Water Scarcity in Iraq**

Iraq faces one of the world's most challenging water management situations, and its effects are far reaching in the international community. The key factors driving water scarcity in Iraq is population growth and migration to urban areas, current agricultural practices and lack of conservation coupled with drought, and regional conflicts.<sup>26</sup>

The region has experienced a population increase of approximately 40 percent over the last 20 years and it is expected to grow even more by 2025.<sup>27</sup> The rapid urbanization of Iraq is increasing the demands of water in the domestic, industrial, and municipal sectors. According to the *Central Intelligence Agency Factbook* the current urban population of Iraq is 66.5% of the

population (2011) with a rate of urbanization determined to be 3.05%.<sup>28</sup> With rapid urbanization, municipal governments are unable to develop adequate infrastructure to distribute water, sewage system development, and regulatory tools to manage water for its inhabitants. As urbanization increases, Iraqis will be forced to drink contaminated water from canals and rivers increasing their chances of contracting water borne diseases compounding a desperate situation.

Agriculture requires an exceptionally large amount of water to provide sustainable crops for a population. Irrigation for agricultural products accounts for three quarters of the region's freshwater withdrawals.<sup>29</sup> Iraq has poor agricultural practices preferring to use flood irrigation vice drip irrigation. The amount of water used for irrigation in Iraq has created problems such as increases in salinity, low soil productivity and infertility, and further deterioration of ground water. The Iraqi Minister of Agriculture Ghazi al-Abboudi announced that the Iraqi government was thought to be able to grow enough crops to feed its population by 2015 but ISIS has reduced Iraqi agricultural industry to only producing 40% of the expected production.<sup>30</sup>

Climate change is increasing the challenge of Iraq's government in dealing with water scarcity. Iraq possesses extremely variable weather patterns with extreme shifts in rainfall patterns that exacerbate the current water shortages. Continued high temperatures will only increase the likelihood of droughts causing a decline in crop production, rise in unemployment and further migration of farmers to urban areas. If Iraq was to encounter unusually high amounts of precipitation farmers and city authorities are not prepared to collect the rainwater and control excess discharge of river water.<sup>31</sup>

Continued drought and temperature increases have created a desertification effect where land degrades to an unusable state caused by climate change and human mismanagement of water and land resources.<sup>32</sup> Unfortunately Saddam Hussein's water projects to divert streams and rivers

destroyed 60% of the marshlands to gain military access to fight against the Marsh Arabs.<sup>33</sup> Further reductions in water availability have had an adverse impact on Iraq's hydroelectric plants that are under capacity for power production.

Regional conflict has generated large populations of internally displaced persons, which further strain water resources through migration. When ISIL took Mosul and Nineva on June 14, 2014 over one hundred thousand Iraqis fled to neighboring Turkey and thirty thousand fled to Jordan.<sup>34, 35</sup> Military fighting has destroyed water infrastructure creating a water management issue for governmental leaders. Further, complicating matters for Iraq is that they lie downstream from Turkey, who has built numerous dams and can control the flow of water into Iraq.

Regional and local level political conflict of the riparian neighbors in the Tigris-Euphrates River Basin is a constant occurrence.<sup>36</sup> Figure 1 depicts Iraq is in a vulnerable position as the downstream neighbor of Turkey and Syria. In the Tigris-Euphrates River Basin, there is a lack of agreement for trans-boundary water management. Without agreements and understandings codified in writing, useful long-term water control is difficult to pursue. The standard argument involves Iraq accusing Turkey and Syria of limited the flow of water due to their use of hydroelectric dams. In response, Turkey and Syria claim that Iraq mismanages their water.

Iraq is at the mercy of Turkey for its allocation of water from the Tigris and Euphrates headwaters. Iraq's southern agricultural lands have not been producing adequate crops; this was evident during the drought in the summer of 2009 where Iraq recorded a record low wheat harvest.<sup>37</sup> The effects of the drought coupled with no increase in water supply resulted in a poor crop harvest where the Marsh Arabs abandoned their farms and migrated to other locations. During the drought Nasiriyah, Iraq lost half of its hydroelectric power due to lower water levels.

The ecology of Iraq suffers especially in southern areas where salination has created water quality issues in Iraqi communities.

Competition for water in the Tigris-Euphrates River Basin is only going to increase across every sector. During the next 20 years, the Middle East in general will continue to experience hydro-political problems due to water scarcity and competition. Freshwater will not naturally replenish itself at current levels of human consumption further complicating the regions' ability to produce hydro-electric power and food production continuing to stagger economic growth. Management of water resources is essential in preventing social tensions and creating stability in the Middle East.

### **Trans-Boundary Water Collaboration**

With the Middle East's growing population, development, and current management of their water resources cooperation is a more likely option than conflict. Historically, regions that consistently have water scarcity problems turn to water-sharing agreements rather than violent conflicts.<sup>38</sup> Aaron Wolf, a professor in the Department of Geoscience at Oregon State University, looked at water conflict in their Basins at Risk found that "there is a relationship between change in a water basin and the institutional capacity to absorb that change."<sup>39</sup> In his interview with the Wilson Center's Environmental Change and Security Program Mr. Wolf explained, "Whether there is going to be conflict or not depends in a large part to what kind of institutions there are to help mitigate for the impacts of water competition."<sup>40</sup>

In their article for United Nation Educational, Scientific, and Cultural Organization A World of Science Journal titled "The Key to Managing Conflict and Cooperation Over Water," Kramer,

Wolf, Carius, and Dabelko studied water cooperation and conflict from 1945 to 2008. They determined that there are more than twice as many cooperative outcomes than conflicts of riparian neighbors. During droughts, international cooperation increased to affected countries. Those countries that experienced conflict, it was because of quantity and infrastructure issues. Problems associated with water quality, economic development, hydropower, and management did not generate the same problem.<sup>41</sup>

Collective management of the Tigris-Euphrates River Basin will take a full range of policy, legal, and institutional reforms to improve relations with the water scarcity conditions. Long term success will have to be tied to data collection, multi-country planning and implementation of governance reforms with investment by outside entities that have a stake in the political situation in Iraq. The key to cooperation, as opposed to conflict, will be dependent on Iraq's governmental institution's ability to manage water scarcity. The Ministry of Water Resources (MOWR) is the Iraqi institution responsible for managing water resources.

The current MOWR for Iraq is Moshin Al-Shemmari and the MOWR website provides its vision as, "Water is the fountain at life, let's work together to retain it for better future." The mission of MOWR states, "Developing and protecting water resources through laying programs and strategies in order to create integrated water policies to follow up and keep our trans-boundary water rights."<sup>42</sup> Mr. Al-Shemmari struggles to balance all the water needs of Iraq including; water clean enough for human consumption, available water resources to provide irrigation to crops, a flow of water to produce hydro-power for industry production and a project to restore the marshlands. The overarching goal of Mr. Al-Shemmari is to, "transform and modernize the MOWR into a dynamic and efficient organization that meets current requirements and optimizes future utilization of the diminishing water resources of Iraq."<sup>43</sup>

## **Threat of Conflict**

Due to the work of Wolf and his colleagues many policy makers who routinely discussed water wars in the 1990s and early 2000s were able to take comfort in the academic findings that show more cooperation occurs over trans-boundary waters than conflict. However, this educational information should not lead to complacency. A study of armed conflict shows that there is a multitude of reasons that countries go to war. The current water disputes in the Middle East are feeding into other conflicts such as ISIL's efforts to leverage resources against its opponents.

In the Tigris-Euphrates River basin demographic pressures, industrialization, and urbanization increase the demand for water. Supply will not keep up with the current and future demand. The effects of climate change will add to the demand for water. The linkages between water mismanagement, climate change, and social/political instability have security implications at both the regional and international level.<sup>44</sup> Over the next ten years, war over water will not be a threat to the United States.<sup>45</sup> However, the combined effects of water competition compounded by poverty, social tension, and environmental degradation, weak and ineffectual leadership contribute social disruptions that can result in state failure.<sup>46</sup> The United States is in an excellent position to lead regional countries in the Tigris-Euphrates River Basin in projects to improve water quality and look to inventive ways to manage the current and future supply of water.

## **The United States and the Tigris-Euphrates River Basin**

Assuming no changes in water management practices between Turkey, Iraq, and Syria, the U.S. is in a position to generate cooperation. As a leader for global stability, reducing water scarcity in Iraq enables the U.S. to achieve more long-term political objectives of strengthening regional stability in the Middle East. Water shortages issues in the Middle East described by the *Global Water Security Intelligence Community Assessment of 2012* provides the U.S. with an initiative to operationally provide support to a troubled region. Facing tightened budget restrictions and possible isolationist politics could constrain efforts to build a regional stability in the Middle East.

Taking the lead on such an expansive project requires the U.S. to develop a structured approach in order to achieve U.S. foreign policy goals. As the leader in the global community the U.S. can develop policies for Iraq to manage water more efficiently at the local level, thereby showing Turkey and Syria they are committed to reducing water scarcity. By reaching out to the international community, the U.S. could foster legal support and governmental, institutional measures for the shared waters in and around the Tigris-Euphrates River Basin. To fully appreciate the issues along the Basin, the U.S. must understand the context of the area to include: key actors and stakeholders needs, capacities, motives and respective positions in the socioeconomic hierarchy. Water scarcity breeds a zero-sum competition mindset, the U.S. must transform this into a win-win outcome with the objective of effective water management at the local and regional level.<sup>47</sup>

The U.S. possess historical data of global water information gathered by governmental agencies, non-governmental organizations (NGO), and science institutions. This information needs to be coalesced into a single entity to unite efforts at producing solutions to water scarcity.<sup>48</sup> Economically the U.S. will have to support development projects and pay for costs of

moving personnel and equipment to the Middle East. By developing a comprehensive water strategy the U.S. must consider supply and demand dynamics between multiple stakeholders, political entities, and ecosystem requirements across multiple geographic areas. Such an undertaking is an effective way to create cooperation between riparian states and further pursue U.S. foreign policy objectives.

## **OPERATIONAL WATER MANAGEMENT**

To support U.S. strategic goals the water scarcity issue needs to be elevated to a whole of government approach instead of a humanitarian assistance policy. Water seems to be a missing element of U.S. stabilization goals between and within countries. Water scarcity coupled with; population increase, further consumption and desire for energy, and ineffectual governments has produced a tipping point in many countries in the Middle East. The consequences of consumption and mismanagement of natural resources is geopolitically destabilizing. Actions by the U.S. to provide populations with access to fresh drinkable water through revitalizing irrigation techniques, domestic infrastructure, and economic activities will produce positive results for the countries in the T/E Basin.

Currently, the U.S. has the technological ability and financial resources to help relieve water scarcity problems in the Basin. However, a lack of coordination between different agencies has led to a haphazard approach to water issues. In its white paper, *Global Water Future*, the Center for Strategic and International Studies (CSIS) found that, "the lack of formalized coordination between all of the government agencies engaged in global water challenges resulted in failed U.S. government attempts to efficiently leverage immense expertise in water issues."<sup>49</sup> The paper

goes on to further explain "individual agencies are doing meaningful work, but in a largely uncoordinated manner that does not allow better targeting and cooperation."<sup>50</sup>

The U.S. should focus its efforts in Iraq to fund water treatment, flood control, irrigation and water dispute management. The U.S., working alongside its interagency partners, could conduct this undertaking as an innovative and revolutionary approach to helping regions become self-sustaining and stable. To provide security for personnel, the U.S. should require the international community to commit to the use of military forces to provide security.

Diplomatic measures should be taken to support the existing basin agreements while opening diplomatic channels to support new ideas for shared water resources. Water capacity may be improved through partnerships with inter-agency organizations and training to gather data to develop models enabling local users to manage better and forecast their water resources.

The Intelligence Community Assessment report also stated, "The U.S. expertise in water management is widely recognized, the developing world will look to the United States to lead the global community toward the development and implementation of sound policies for managing water."<sup>51</sup> The U.S. can offer ways to improve water management and provide the equipment and training for water treatment while encouraging efficient use of water to relieve water stressed areas. The report further explained how the United States can support the development of "legal and institutional arrangements that resolve water disputes or advance cooperative management of shared waters."<sup>52</sup>

The United States can benefit from pursuing a leading role in hydro-politics of the Middle East. Creating a strong international institution the U.S. can be responsible for establishing a strong balance of conflicting interests over water allocation and providing training and education to riparian states. Currently, Iraq and Syria lack the human, technical and financial resources to

advance a comprehensive water management plan and ensure its implementation. The U.S. is postured to provide security and stability with regards to hydro-politics. Underlying reasons for water related controversy can be numerous, but all water disputes can be attributed to one or more of three issues: quantity, quality, and timing.<sup>53</sup>

## **Risks**

The risks associated with involving the U.S. in the hydro-politics of the Basin is related to existing regional tensions between nations that must implement new changes. Change may result in unintended second and third order effects. Providing the Basin with hydrological modeling and databases will require a significant amount of human and financial capital. All stakeholders will have access to the shared data that may further identify poor institutional performance and could reinforce perceptions of elitism, exclusion, and corruption.<sup>54</sup> Developed policies and programs should include meetings with the leaders of the local population and take into account political power distribution and social order to avoid social tension.<sup>55</sup>

Despite the strategic importance of water scarcity and potential risk to international stability the U.S. has been slow to take the lead in shaping water sharing agreements between riparian neighbors. In discussing water scarcity in the T/E Basin, the U.S. government must define the impact on U.S. national interests, and what steps the government may take to alleviate water scarcity. The U.S. is plagued with bureaucratic inertia; USAID, the State Department, and intelligence communities all write and discuss the issues stemming from water scarcity yet no single entity has been tasked to take the lead.

In order to address the water scarcity issues of Iraq and Syria, the U.S. must determine how much water is being used, for which purposes, and find ways to collect data concerning river flow. Unfortunately, this information isn't readily available in Iraq or Syria so the U.S. will have

to invest large amounts of capital to determine this information and develop a comprehensive strategy to address the current management of water supplies. The U.S. has a preference for immediate, tangible, and inexpensive results, but addressing and working to alleviate water scarcity in the Basin will take time, money, and effort.

## **Conclusion**

If the U.S. provides effective, proactive resource management to the Tigris-Euphrates River Basin, it will increase chances that riparian neighbors in the T/E River Basin will implement a policy that provisions water, in turn, minimizing conflict and competition. By focusing on water scarcity the U.S.; has additional leverage to impact Middle Eastern foreign policy objectives by promoting stability and security in the region, will reduce extremist violence, will support democracy and enable reconstruction. Developing a water sharing agreement amenable to Turkey, Syria, and Iraq gives the U.S. a strong basis to limit Iranian influence.

Trans-boundary waters require regular political and diplomatic engagement in development, economic, and environmental policies affecting the flow of their rivers. Improvements in water usage may prevent conflicts and social tensions by allocating scarce water resources to provide a better life for the population. The U.S. can implement a foreign policy to generate and sustain trans-boundary cooperation at the regional economic and political level. To achieve these positive effects the U.S. must demonstrate political interest and be prepared to make a substantial financial investment in water infrastructure projects.

Making an investment in the hydro-politics of the Tigris-Euphrates River Basin could yield a significant benefit if Syria, Turkey, and Iraq reach agreements that increase their cooperation and

avoid conflict. Building capacity, multi-lateral water monitoring systems, and transparent water data can only strengthen the institutions currently in place. Such an undertaking requires considerable political involvement by the U.S. and international partners who must have the determination to negotiate and support policy for trans-boundary water agreements.

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