Strategy Research Project

United States Approach to Water Security in Northeast Africa

by

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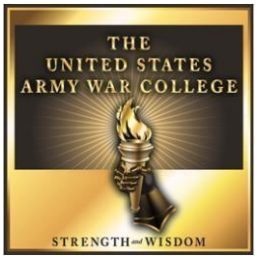

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United States Approach to Water Security in Northeast Africa

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Abstract

The world's growing water scarcity issue has the attention of governments, global organizations and influential individuals. Many groups and organizations are focused on bringing water access and sanitation to those who are without, but far fewer organizations are focused on transforming water demand and mediating the trans-boundary water-sharing issues that threaten conflict around the globe. Water, by itself, is unlikely to lead directly to conflict, but when combined with other regional tensions or long-standing disputes, could easily become a tipping point for war. The time is right for United States engagement in Northeast Africa water-sharing, specifically in Egypt, Libya, Sudan and Ethiopia. Working through the United Nations and African Union, the United States should assist in developing realistic water-sharing agreements on both the Nubian Sandstone Aquifer System and the Nile River Basin. In the absence of working agreements, developing countries like Ethiopia are moving forward on projects such as the Grand Renaissance Dam that serve their own interests while heightening regional tensions over water rights. As political situations stabilize in Libya and Egypt, it is in the United States' interests to enhance efforts supporting regional stability while advancing American influence and building long-term allies in the region.

United States Approach to Water Security in Northeast Africa

> When we try to pick out anything by itself in nature, we find it hitched to everything else in the universe.
>
> —John Muir[1]

As with any valuable resource, increasingly higher demand combined with shrinking supply drives the value ever higher. The necessity and scarcity of the resource drives the length to which a person, society, or nation will go to in order to control or acquire it. Likewise, conflict over valuable resources, whether land, oil or mineral ores has led to the rise and fall of great nations throughout history. Land, oil, and mineral ores fuel the world economy while providing both physical and economic buffers. Countries that own or control these resources enjoy the benefit of national power; with more resources come the potential for more global influence. Hence, the desire to control even more resources. Resource prices fluctuate based on global supply and demand, futures are traded on stock exchanges and alliances are built to share the benefits. As these resources become scarce to the point of no longer being sustainable or available, technology will inevitably find society alternate solutions. As it goes with the age-old adage, “necessity is the mother of invention,” or the world will simply do without.

Water, on the other hand, is an exception. Water is nature’s perfect creation, a life-renewing resource built simply from two parts hydrogen and one part oxygen. It is gentle enough to provide sustenance to the smallest of creatures while strong enough to literally move mountains and shape beautiful landscapes. As a valuable natural resource, water has the potential to take the conflict to a new level. Water not only maintains quality of life but more importantly is required for life itself. The world is

beginning to recognize that there simply is no substitution for water as there is for oil, gas, or precious metals. For instance, the retail price of bottled water now exceeds the spot price of crude oil.[2] It is reasonable to conclude that global water demand, which outpaces supply due to growing population and economic engines will eventually lead to increases in water-related conflict, especially in areas of the world where water deficits run high and water security is at risk. In 2012, United States Defense Intelligence Agency concluded that demographic and economic pressures in North Africa, the Middle East, and South Asia will result in significant challenges in coping with water problems in the coming decades.[3]

The time for the United States, as an international leader in water security issues, to assist in these three regions is now. Although the current administration promotes an "America First" policy, involvement in international conflict prevention remains a vital United States national interest. The United States has its own domestic water challenges including running an annual water deficit each year, but it also has adequate systems in place to manage water disputes peacefully and the technology base needed to lead the rest of the world in collaborative water management solutions. The United States should focus initial efforts in Northeast Africa, where two shared water resources between the countries of Egypt, Libya, Sudan and Ethiopia, among others, currently generate significant friction in the region. The United States, often working through the United Nations and African Union can assist Northeast African countries in achieving water security through cooperation rather than conflict. Ultimately, when countries work together towards cooperative water security, they reduce the potential for conflict.[4]

Technology may not provide the “silver bullet” in a water crisis as it often does replacing other resources. Technology is a double-edged sword: it drives economies to processes that utilize ever-increasing amounts of water while simultaneously offering various methods to conserve this precious resource through innovations in extraction, agriculture, desalination, and distribution systems. Ultimately, technology *in combination* with cultural changes that foster water conservation and efficient utilization is needed to avert a true global water crisis.

Importance of Water

Water is the building block for both life and societies; it is the lifeblood of human existence. There is great irony in a planet that provides so much life to so many species when water covers over 70 percent of the Earth’s surface, yet only three percent of it is fresh and directly suitable to sustain human life. Earth’s water cycle is a closed loop system with a constant volume in various forms of liquid, solid and gas. Oceans, seas, saltwater lakes, and underground salty reservoirs contain over 97 percent of the planet's water, while only the remaining two and a half to three percent located in lakes, reservoirs, glaciers and underground aquifers are fresh.[5]

Water has a significant impact on world economies and societies, therefore, it is in the United States’ national interest to support and enhance global water security. Global food security and energy security are derivatives of water security. From food people eat to the energy that powers industries, homes, and automobiles, water is the essential and non-replaceable ingredient. While water is generally considered abundant today in many parts of the world, recorded conflicts over water access and water rights date back to at least 2,400 B.C. when the King of Lagash, in present-day Iraq, diverted water to boundary canals, drying up ditches to deprive the city of Umma of water.[6]

Modern conflict over water exists domestically within the United States as well as with its neighbors in North America, between India and Bangladesh, between China and other Southeast Asian states and between Egypt, Sudan and Ethiopia in Northeast Africa over the Nile River.[7] Present day tensions over waters of the Nile resulted in both Sudan and Egypt amassing soldiers along the Eritrean border in February 2018 as disputes over the construction of an Ethiopian dam along the river and ultimate control over the river's waters continues to heat up.[8] The 2012 United States Defense Intelligence Agency Report on Global Water Security stopped short of predicting that water scarcity would lead directly to conflict or all-out war in the next ten years, but it did state that as water shortages become more acute beyond the next decade, water in shared basins may likely be used as leverage, or worse, as a weapon to further terrorist objectives.[9] The study also predicts that over the next ten to 30 years, depletion of groundwater as well as water shortages and pollution will contribute significantly to global food shortages and downturns in the economic performance of United States' trading partners.[10]

Food and water are inextricably linked; water is the largest limiting factor in attaining global food security, especially amid dramatic population increases.[11] The future of humanity depends both on water and how food will be produced and provided.[12] Food production is the greatest consumer of water globally, accounting for somewhere between 70 to 90 percent of annual consumption. In the United States, for example, water withdrawals for agriculture range between 80 to 90 percent of domestic consumption.[13] As global population increases over the next 50 years, requisite food production is anticipated to grow by approximately 60 percent, further stressing global

freshwater supplies.[14] Agricultural methods, especially in the developing world, are partly to blame based on inefficient methods of water delivery and irrigation. The Food and Agriculture Organization of the United Nations (FAO) estimates that nearly half of the groundwater withdrawn from aquifers actually support plant growth, with the other half lost in various stages such as transmission, distribution, and application.[15]

Countries often equate the ability to feed themselves with sovereignty, placing inordinate emphasis on agricultural production, especially in water-stressed regions, even when that production does not significantly add to the national economy. Poorer states, such as Uganda and Ethiopia often depend heavily on their agricultural sector as they lack money to buy food from other countries.[16] In these cases, water scarcity is often driven by an imbalance between withdrawals over availability.[17] In Africa, for instance, only 3.2 percent of cultivated land is irrigated, but the continent ranks number one in agricultural water withdrawals as a percentage of renewable water resources.[18] The countries of Northeast Africa are using more than 40 percent of their renewable water resources for agriculture, while still importing a significant amount of food to feed their population.[19] In Chad, Sudan, Uganda, and Ethiopia, where undernourishment ranges from 20 to 35 percent or more among the population, water withdrawals per person rival that of much more modern nations, suggesting significant waste and inefficient agriculture.[20]

Culture and diet also play a role in increased water usage; wealthy people use more water.[21] As economies expand and populations attempt to overcome poverty and achieve relative affluence, protein is becoming a higher proportion of diets, on average, than at any point in human history.[22] Compared with traditional grain crops, livestock

utilizes a much higher amount of water per unit. For instance, the production of one kilogram of beef uses up to 1,500 liters of water over the lifetime of the animal, including processing and transportation.[23] As more people are lifted out of poverty, especially in Asia and Africa, the desire for protein and the associated demand on global water supplies will certainly grow.

The United States will play a central role in meeting these water-related challenges over the next 40 years and beyond. Although its domestic water policy is often challenging, with states generally holding more power and influence over water issues than the federal government, the United States is widely recognized around the world for its expertise in water management and technological innovation. The developing world will look to the United States to lead the global community in negotiating, developing, and managing water resources, which requires a whole of government approach, to include the Department of State, Department of Defense and Department of Agriculture, as well as the National Aeronautics and Space Administration (NASA) and the United States Geological Survey (USGS).[24]

Water Security in Northeast Africa

Northeast Africa, to include portions of the Eastern Sahel and the Horn of Africa, is hugely important to the United States' national interests and military strategic goals. Strategic alliances and functional economies in Northeast Africa are critical to countering the spread of violent extremist organizations on the continent that threatens United States' interests worldwide. Africa's pervasive poverty and lack of economic prosperity in certain regions are closely linked to its water management, lack of adequate infrastructure and its dependence on rain-fed subsistence agriculture.[25] Projected population growth combined with negative effects of climate change on

precipitation patterns will only stress water systems more across the continent in the future.

Despite these challenges, Africa has extensive economic potential based on land, manufacturing, natural resources and agricultural advances in many areas of the continent. Hence, there is a global competition to create alliances with Africa, particularly to support trade and exploitation of resources. China is strategically positioning itself to be the dominant future trading partner with Africa, learning from past European colonization.[26] China is investing heavily in Africa infrastructure, to include water systems, with an eye on exploiting natural resources and developing long-term trading alliances. Chinese infrastructure funding is often attractive to cash-strapped African countries, whose primary leverage is limited to natural resources, which China desperately needs to continue fueling its economy. Chinese interest in water systems and agriculture on the African continent are self-serving; China relies heavily on food imports to feeds its burgeoning population. First and foremost, Africa needs efficient water systems and agricultural practices to simply feed its own people, not to export food around the world.

The United States currently has a window of opportunity to assist Northeast African countries in developing their economies, specifically in developing water security, management, and infrastructure that directly impact economic success. To build strategic alliances, the United States focus its efforts on several countries that have suffered recent political instability combined with consistent annual water deficits that lead to water insecurity. Libya, Egypt, Chad, Sudan, South Sudan, Uganda, and Ethiopia are ideal countries for immediate support based on geographic location, long-

term potential as strategic allies, and the fact that they share cross-border water sources between the Nile River system and underground aquifers. The United States Department of State lists Ethiopia, South Sudan, and Uganda as "high priority" countries under the Water for the World Act for October 1, 2017, to September 30, 2018, where it will focus the efforts of multiple internal agencies to best protect its national interests.[27] Successful regional water management systems combined with updated infrastructure, distribution systems, and agricultural practices may lead directly to sustained increases in economic success and improved quality of life. Nations willing to lead this effort may well reap the benefits of long-term strategic allies in the region, both in economics and security.

Water Scarcity in Libya

Libya, a country over twice the size of Texas, is located in Northeast Africa along the Mediterranean Coast. A vast majority of a population of six million lives in large cities along the 1,770 kilometers of coastline in the north of the country. The country is divided into two climate types: Mediterranean along the coast and dry desert in the southern two-thirds of the country; there are areas in the south of the country that go for several years at a time without precipitation.[28] Only 4 percent of the country's water comes from surface sources, as low humidity and high temperatures lead to significant evaporation; 96 percent of the country's water supply comes from groundwater, to include coastal aquifers which are becoming increasing intruded by salt water.[29] Other groundwater sources in Libya include the Northwestern Sahara Aquifer System, the Murzuk Basin Aquifer System and the Nubian Sandstone Aquifer System (NSAS), one of the largest in the world. All three aquifer systems cross boundaries with various

neighboring countries and are non-renewable, meaning they do not recharge. The NSAS underlies Libya, Chad, Egypt, and Sudan with a population totaling over 136 million, pumping water for both domestic and irrigation supply since the 1960s. While all four countries signed a *Strategic Action Plan* to manage the water from the aquifer in 2013, Libya's excessive withdrawals continue to create tension in the region.[30] Libya also relies on limited desalinization, mostly near coastal cities. Libya currently has ten desalinization plants operating and four under various stages of construction.[31] Desalinization is expensive when considered by cost per unit volume of water due to the large amount of energy required for the process, which is why many experts do not see it as a viable, long-term alternative for large-scale production in the near future.

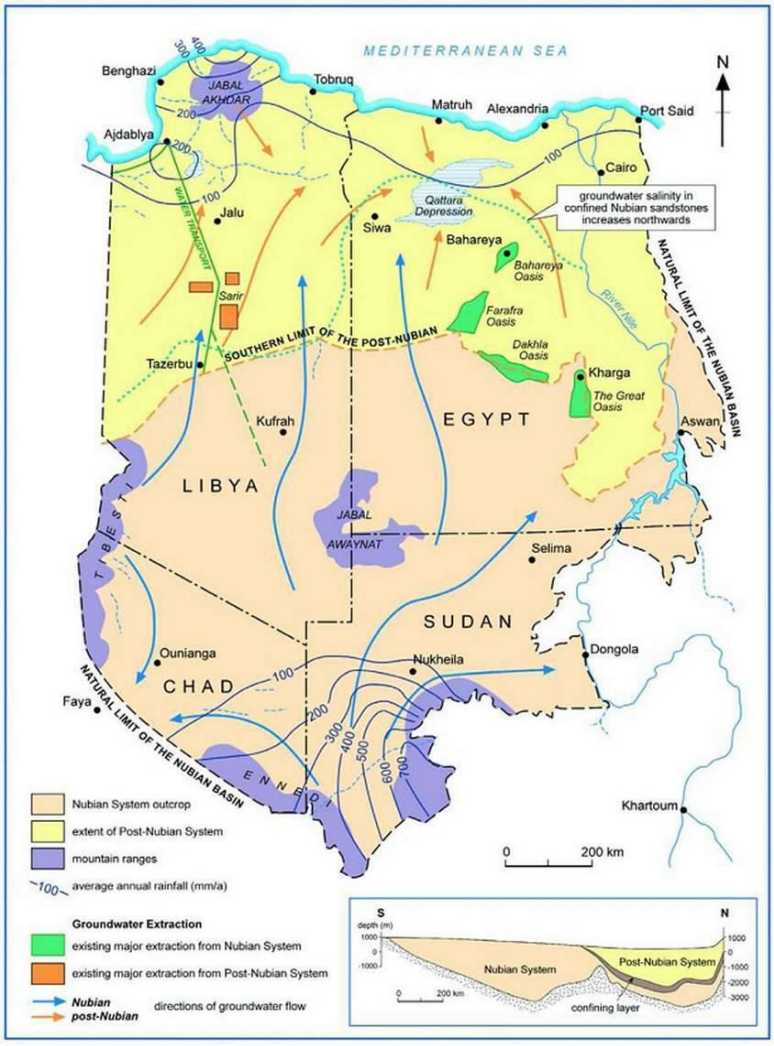

Figure 1. Nubian Sandstone Aquifer System (NSAS)[32]

Libya uses more water than it renews, resulting in a water deficit of over 21 percent, with agriculture accounting for up to 85 percent of freshwater usage, a sector that does not contribute proportionally or significantly to its economy.[33] Libya has grappled with water security issues for decades, ranging from water resource sustainability and management to infrastructure development.

Following the North Atlantic Treaty Organization (NATO) led operation in 2011 to topple dictator Muammar Qaddafi, Libya disintegrated into feuding factions, opening a door for the Islamic State of Iraq and Syria to open a new “franchise.”[34] Starting the day

after the dictator was killed, hard questions surfaced between the United States and European allies on who would lead the reconstruction effort.[35] Prior to 2011, Chinese investments across numerous economic sectors, to include water infrastructure, topped $20 billion in United States dollars.[36] In the wake of political unrest following the NATO mission, the Chinese deferred making any further investments until stability was reached, evacuating some 35,000 Chinese laborers.[37] Eight years on, the country is beginning to stabilize, albeit under a Sharia Law legal system, and Chinese investment and influence may soon return in force, making it even more important for the United States and United Nations to act now.[38]

Libya's Great Man-Made River (GMMR) project, developed over the past several decades and now complete except for one final phase, provides over six million cubic meters of freshwater per day from underground reservoirs, to include the NSAS, in the south of the country to the coastal cities.[39] As impressive an engineering accomplishment as it is, the GMMR is not a long-term water solution, since it is inefficient in both concept and design, and the reservoirs it draws from are non-renewable.

To solve its water problems, Libya must address *both* supply and demand. It must work across all of its water sources, to include dams, desalinization plants, wastewater treatment plants, and groundwater extraction systems to maximize supply. Simultaneously, the country must address growing demand through water policy and management while maintaining cross-boundary agreements for water sharing. Libya must do this while emerging from years of political chaos following rule under an authoritarian regime.

Tensions in the Nile River Basin

The Nile River is the longest river in the world with a basin covering over three million square kilometers. The highlands of Ethiopia contribute a majority of the Nile's flow, supplying up to 86 percent of the water.[40]The Nile flows north through Uganda, South Sudan, Sudan and finally into Egypt before emptying into the Mediterranean Sea. The Nile River basin was home to approximately 160 million people in 2004, a number that is expected to double by 2030, resulting in a potential drop in water availability per person by up to 80 percent.[41]

The Nile River Basin presents significant cross-boundary water challenges in Northeast Africa that, without proper management, could lead to conflict in the region. Following the construction of the Aswan High Dam along the Nile River in 1970, Egyptian President Anwar Sadat boasted that Egypt had so much water that it could lay pipes under the Suez Canal and across the Sinai Desert to provide water to both Saudi Arabia and Israel.[42] This assertion was clearly overblown, as Egypt's agriculture and much of its economy were and are still wholly dependent upon the single river that bisects it from south to north. Indeed, while Egypt might be the most developed country along the river, governance of the Nile must be managed between seven different African countries, including Sudan, South Sudan, Ethiopia, Kenya, the Democratic Republic of Congo, Uganda, and Burundi.[43] The complexities involved in managing the Nile River Basin require significant state to state interaction between those countries, as well as potential external support from other countries to maintain functional cooperation.

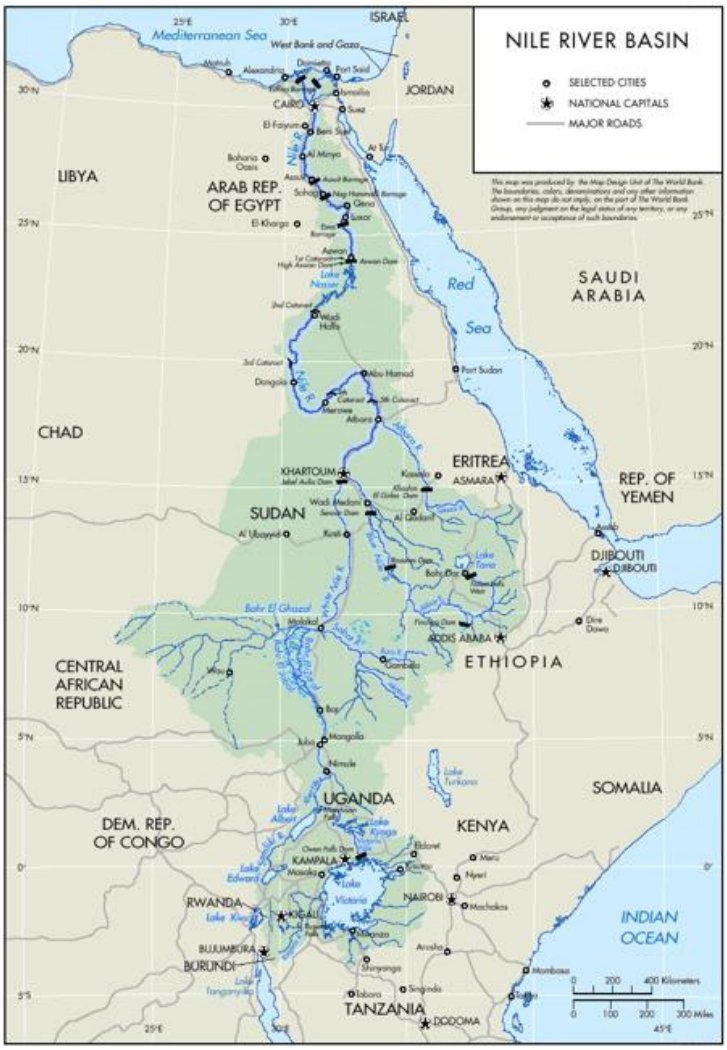

Figure 2. Nile River Basin[44]

Throughout its course, the Nile River encounters significant challenges to water flow due to evaporation in arid regions, seepage in wetlands and long stretches of decreased rainfall due to changing climate patterns.[45] Any attempts to mitigate these challenges near the river's headwaters or in the southern reaches of the river upstream from Egypt and Sudan affect the water flow downstream, creating friction between countries. Continued population growth in the basin combined with regional instability and poor agricultural practices along its length will also contribute to regional friction.

Under colonial rule, Britain, France, and Italy, known as the Tripartite, managed water –sharing along the Nile, generally providing Egypt with broad water rights, as it was the most economically proficient country.[46] The Tripartite developed and implemented several water-sharing agreements between 1902 and 1959, but as more countries along the Nile gained independence in the latter half of the twentieth century, several countries chose not to recognize the agreements made under colonial rule. Understanding that regional cooperation benefited all countries reliant on the river, the *Nile Basin Initiative* (NBI) was formed in 1999 to facilitate transboundary cooperation.[47] The NBI sought the cooperation of the Nile's riparian areas as a catalyst for economic integration and resolution of key regional issues.[48] Ten years after its founding, the NBI developed a *Cooperative Framework Agreement* (CFA) which sought to create a commission that would have the authority to manage waters of the Nile across all riparian countries. However, Egypt and Sudan, downstream countries that consume a majority of the river's waters, refused to sign, continuing to claim historical rights to the waters.[49]

Exacerbating Egypt's water concerns is the construction of the Grand Ethiopian Renaissance Dam (GERD) in Ethiopia. Ethiopia sees the GERD as a pathway to prosperity, providing water and electricity to spur economic growth and enhance food security. Egypt's primary concern is that the GERD, when fully operational, could short the downstream country of up to 25 million cubic meters of water per year, or nearly half of its annual water allocation.[50] Hence, continued construction of the GERD complicates efforts to ratify the CFA across all countries in the Nile Basin. Before agreeing to sign the CFA, Egypt seeks assurances in writing that guarantee its access to historical

amounts of water. Egypt's fears of the GERD are not unfounded. Indeed, all requisite studies of the potential downstream effects of the dam have not been completed, yet Ethiopia desires to begin filling the reservoir behind the dam prior to the final completion of the hydropower project. In 2015, Egypt, Sudan, and Ethiopia agreed to a Declaration of Principles that would contract an independent agency to study the downstream effects of the dam, but as of the end of 2017, the study had hardly even begun.[51] More recently, in January 2018, the leaders of Egypt, Sudan and Ethiopia met at an African Union summit in Addis Abbas in hopes of breaking the deadlock over construction and operation of the dam, but no agreement or resolution has yet been attained.[52] Meanwhile, tensions remain high with Egyptian and Sudanese troops in a standoff along the Eritrean border.

External players are also attempting to facilitate a solution in the Nile Basin. The United Nations Convention on the Law of Non-Navigational Use of International Water has attempted to facilitate transboundary cooperation, but a consensus among all Nile Basin countries on water-sharing remains elusive.[53] Future pressures from population increases, climate change, and agricultural impacts are sure to exacerbate stresses between countries. External support, in the forms of water-sharing negotiations and technology applications will be crucial to managing tensions in the region.

Current United States and International Initiatives in Northeast Africa

The United States clearly has a vested interest in the economic and political success of sovereign African nations. The 2017 *National Security Strategy* (NSS) outlines specific goals of maintaining American Prosperity and Advancing American Interests; assisting in the advancement of water security in Northeast Africa supports both.[54] The 2017 NSS states, "The United States seeks sovereign African states that

are integrated into the world economy, able to provide for their citizens' needs, and capable of managing threats to peace and security."[55] America seeks active markets in Africa capable of buying its exports, which requires populations that can afford those goods. Water security is essential for creating profitable industrial and agricultural bases that support thriving economies. Hence, the United States should continue working alongside global partners to ensure water security on the continent.

The Department of State is the lead federal agency for Water Security. The 2017 United States Government Global Water Strategy outlines four strategic objectives:

- "Increasing sustainable access to safe drinking water and sanitation services, and the adoption of key hygiene behaviors;
- Encouraging the sound management and protection of freshwater resources;
- Promoting cooperation on shared waters; and,
- Strengthening water-sector governance, financing, and institutions".[56]

Arguably, in Northeast Africa, the latter two strategic objectives are the most important, as the source of regional tensions lie in the sharing of both underground aquifers and transboundary river systems. Likewise, countries in this region seek external technical support and financing for water infrastructure projects, which China is willing to provide in the absence of American money and technology. With a view towards strategic alliances, the United States should take advantage of the opportunities now presented in the region, especially before China fully renews water infrastructure support in nations such as Libya and Egypt.

The Department of State intends to implement this strategy by mitigating tensions over shared water resources. Within this context, the department seeks to build political will for cooperation, but this has been largely unsuccessful in regards to

both the Nubian Sandstone Aquifer System and Nile River Basin.[57] In fact, Ethiopia is the only Northeast African country on the department's High-Priority Country list, where United States Agency for International Development (USAID) efforts are focused primarily on individual water access and sanitation.

United States Africa Command (AFRICOM) is engaged in water security on the continent, primarily through its Environment Directorate. The Directorate has contributed significant academic work to address water security in the Nile Basin with an understanding the conflict within the basin could fan existing conflict in the Greater Horn of Africa region.[58] AFRICOM has a clear understanding of the regional tensions associated with the Nubian Aquifer System and Nile River Basin and makes recommendations for the implementation of military approaches, specifically to enhance regional security.

United Nations (UN)-Water is a coordinating agency within the United Nations that works to synchronize the water-related efforts of over 30 sub-organizations. Under the UN-Water umbrella are numerous institutions such as United Nations Economic Commission on Africa and the UN-Water Convention, formally known as the Convention on the Protection and Use of Transboundary Watercourses and International Lakes. The UN-Water Convention seeks to facilitate cooperation between countries that share resources and serves as a universally available legal framework which countries can use to work through day-to-day challenges associated with transboundary waters.[59]

Near-term Water Security Approaches

While the countries of Northeast Africa have shown the willingness to engage in dialogue over sharing of water resources in the past several decades, significant challenges remain. Given the current impasses on both the Regional Strategy for the

Utilization of the Nubian Sandstone Aquifer System and the Nile River Basin CFA, external intervention is needed. The United States has an opportunity to wield multiple instruments of national power such as diplomatic, economic and military efforts to help resolve these longstanding issues. Desired outcomes include should include reduced cross-boundary tensions, increased regional water security and long-term strategic alliances on the African continent.

First, as a donor to the Nile Basin Trust Fund, which transfers funds to the NBI for projects, the United States has influence with the NBI. The Department of State should seek an increase in both funding for the NBI and its diplomatic efforts to lead the development of a basin-wide water-sharing agreement for Northeast Africa. By applying lessons learned from domestic water disputes, the United States can offer realistic water management alternatives necessary to bring all interested countries back to the negotiating table. Additionally, the United States could assist in funding and executing environmental studies of the downstream effects of the GERD, a primary impediment to Egypt's signing of the NBI's *Cooperative Framework Agreement*.

The United States, through UN-Water (UN-Economic Commission for Europe) and UN-Water Convention, should work closely with the African Union, leveraging influence with the World Bank, to find resolutions to transboundary water-sharing in Northeast Africa. Specifically, the African Union should work to bolster cooperation between stakeholders, both in underground and riparian systems, with the goal of assuring just and equitable distribution of water.[60] Incentivizing cooperation through more shared infrastructure financing with international partners is a model that deserves

attention. Additionally, the African Union should assist in the collection and sharing of data required for transparency at regional and national levels.[61]

Second, the Department of State, through USAID and potentially the United States Department of Agriculture, should apply lessons learned from water conservation and management in Israel. Israel has all but solved its water issues by focusing on demand rather than supply. As stated previously, irrigation in support of agriculture accounts for up to 80 percent of water consumption globally. Agricultural practices, especially those in Northeast African countries waste an extraordinary amount of this precious resource. Israel has moved almost exclusively to drip irrigation, saving somewhere between 25 to 75 percent over traditional irrigation techniques while increasing yields by up to 15 percent.[62] Assisting Northeast African governments in transitioning agricultural communities from flood or sprinkler irrigation to drip systems could significantly reduce demand and with it, tensions over water supply.

Israel has dramatically increased their water supply through a combination of water recycling of both domestic and industrial waste while also significantly increasing desalinization operations in support of coastal cities.[63] Similar technology could be applied to desalinization plants in Libya, but the process remains expensive and is certainly not a viable, long-term solution for agriculture without serious changes to irrigation techniques. Wastewater treatment facilities are also expensive to build and demanding to maintain, but cooperative programs to jointly fund more of these facilities along with vocational training programs to maintain them could pay long-term dividends.

Third, the Department of State along with the Department of Agriculture should embark on a campaign, in concert with the United Nations to help transform agricultural

practices in the region with the intent of increasing yields while lowering water demand. The Food and Agriculture Organization of the United Nations (FAO) has reported that African governments reduced spending on agriculture from 4.5 percent in 2001 to 2.4 percent in 2012, which explains why much of Africa missed the “Green Revolution.”[64] Varying soil types and poor crop rotations are partly to blame for poor yields, and certain agricultural practices such as no-till farming, which minimizes waste as well as the need for large amounts of fertilizer could be hugely beneficial. Technologies for genetically modified seeds could also enhance crops yields while reducing water demand.

Fourth, to promote regional security in the face of mounting tensions over water sharing, AFRICOM should continue pursuing cooperative security engagements. Through the Defense Environmental International Cooperation program, which falls under the Office of the Deputy Under Secretary of Defense for Installations and Environment, AFRICOM currently seeks to "enhance regional security by capitalizing on and helping sustain positive trends and existing capabilities while buffering and mitigating environmental pressures that could undermine security and progress.”[65] The intent of the program is to ultimately foster regional collaboration and dialogue on environmental themes through interaction with regional government officials and military leaders.[66] Regional collaboration and security remain absolutely essential to allow other recommendation and actions to occur, especially in light of the current troop posturing by both Egypt and Sudan.

Conclusion

The world’s growing water scarcity crisis has the attention of governments, global organizations and influential individuals. Most groups and organizations are focused on

bringing water access and sanitation to those who are without, which is clearly the first step in building the foundations for better societies and increased quality of life. Far fewer organizations are focused on transforming water demand and mediating trans-boundary water-sharing issues that threaten conflict around the globe. Many experts agree that water, by itself, is unlikely to lead directly to conflict. But, when combined with other regional tensions or long-standing disputes, access to water could easily become the tipping point for war.

Fortunately, many countries in areas with trans-boundary water rights issues are engaged in legitimate talks to solve their shared problems. These talks, which are actually negotiations, often become stalled when the country with the most negotiating power is asked to relinquish the status quo in order to foster the economic prosperity of others. For this reason, international intervention is often necessary in order to incentivize water sharing while playing the role of “honest broker” between the interested countries.

The time is right for United States engagement in Northeast Africa water-sharing, specifically in Egypt, Libya, Sudan and Ethiopia. Working through the United Nations and African Union, the United States should assist in developing realistic water-sharing agreements on both the Nubian Sandstone Aquifer System and the Nile River Basin. In the absence of working agreements, developing countries like Ethiopia are moving forward on projects such as the Grand Renaissance Dam that serve their own interests while heightening regional tensions over water rights. As political situations stabilize in Libya and Egypt, it is in the United States’ interests to enhance efforts supporting regional stability while advancing American influence and building long-term allies.

Endnotes

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