Unemployment, Terrorism, and Water Scarcity Compounded in WANAME Region by Climate Change

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Executive Summary

The most volatile conflict areas in the next decades will come at the nexus of heat, water scarcity, and poverty. This paper examines second- and third-order impacts of climate change across the region most vulnerable to these impacts—West Asia, Northern Africa, and the Middle East (WANAME)—through case studies including Syria, Iraq, Afghanistan, and the Lake Chad region, highlighting an array of the different human security impacts present in each country.

The effects of climate change are felt disproportionately by the globe's poor communities, as increased heat and decreased water cause a dramatic downturn in agricultural jobs. Regional impacts of climate change can lead to conflict over food and water resources and increased participation in illegal sources of income out of desperation. Furthermore, climate change does not affect states within the WANAME region as an isolated variable but rather as an issue compounded by other major challenges, including migration and widespread government mismanagement of conflict scenarios, critical infrastructure, and the agricultural sector.

As people across the WANAME region lose livelihoods in the face of a changing climate, terrorist organizations have begun to capitalize on rising desperation for income and survival. Persons who do not sympathize ideologically with terrorist groups such as ISIS and Boko Haram may become economic recruits to these organizations. Although economic recruits are more likely to become disillusioned with the terrorist organization and wish to retake their former place in society, there are few opportunities for reentry to society. Developing methods for rehabilitated members of extremist groups to reenter society may be one valuable means to help inoculate populations against economic and climate change-facilitated extremist recruitment.

Maintaining legitimate government control of critical water resources will also become increasingly critical in coming years, as terrorist groups use water scarcity as a leverage point. Strategic seizures of dams, barrages, and other water resources are becoming progressively important in terrorist groups' strategy—ISIS' control over Syrian water resources was devastating to Aleppo's population as well as Iraqi populations downstream.

Finally, crafting and formalizing fair agreements for transnational water resources will become paramount as freshwater supplies wane globally. There are currently very few agreements for the world's 263 cross-border water resources, and each of these present a potential conflict point in the coming years. Hydrodiplomacy and bilateral communication largely between countries will be an essential mitigation measure against the coming global water crisis.

Introduction

As global temperatures rise, snow melts earlier, rainfall decreases, and natural disasters produce even more damaging effects than they did before, the reality of the first-order impacts of climate change can no longer be ignored. Nor can the second- and third-order effects that snowball from the decrease in global food and water supply be neglected, which lead in turn to losses of jobs, communities, and lives. The reality of climate change is that it disproportionately affects the poorest regions of the world—those portions of the world which often rely on subsistence agriculture to live. Resiliency, or the ability to bounce back and adapt in the face of overwhelming adversity, against the effects of climate change is difficult, because to a certain extent it is a problem that must be solved collectively at the global level. But on a national level in the worst-hit region—West Asia, Northern Africa, and the Middle East (WANAME)—resiliency can at least be improved.

Climate Change Effects Will Cause Severe Water Scarcity and Worsen Extreme Poverty

Globally, annual rainfall has decreased by approximately 20 percent over the last two decades and continues to diminish,[1] which has led to a greater reliance on groundwater. Groundwater as a resource is only semi-renewable because it replenishes at a far slower rate than the rate at which it is being withdrawn.[2] In concert with a decrease in rainfall, the rising global temperature in the last century (approximately .8° C)[3] means that drought is far more common and severe an occurrence. Countries are increasingly incapable of responding to water needs as underground aquifers grow ever more depleted.

The greatest impact of decreased water supply and increased temperature is on the global agricultural sector. With less available irrigation water, more and more land is left unfarmed as resources are rerouted towards the shrinking amount of actively farmed land.[4] As a first-order effect of climate change, the abandoned land quickly becomes desertified due to the lack of irrigation and decades of chemical fertilizer use, which results in the accumulation of natural and unnatural salts and the eventual salinization of the soil.[5] Globally, 20 percent of arable land has been lost to soil salinization—a land mass comparable in size to France[6]—and an additional 4,942 acres of farmland is estimated to be lost daily, which amounts to a revenue loss of $27.3 billion US dollars in agricultural output annually.[7] This land is virtually unrecoverable since one of the only methods for desalinizing the soil is through leaching, or the flooding of the soil in order to wash the salts away, which requires massive amounts of progressively scarce fresh water.[8] The loss of arable land leads to a second-order effect of climate change: the loss of agricultural livelihoods, which disproportionately affects smallholder farmers who are often among the world's poorest populations.[9]

Climate change effects impact some regions far more heavily than others. Because the poorest populations of the world are largely concentrated in the areas most susceptible to climate stress, they are far more at risk not just to first-order effects, but to second- and third-order effects as well. Agricultural jobs, once the predominant livelihood across the world's poorest nations, are disappearing. Seventy-five percent of the world's poor, according to the World Bank, live in rural areas where agriculture is the sole source of income.[10] As viable

agriculture diminishes, the poorest populations lose jobs in the agricultural sector and find themselves in dire straits where they are unable to provide for themselves or their families. Poorer populations do not have stockpiled resources to fall back on in times of financial or physical stress, as the richest populations do. For families who spend 50-80 percent of their income to secure food, a rise in food prices due to scarcity can mean the difference between life and death, and certainly means that many of these families will have to withdraw children from schools which could provide the opportunities to eventually emerge from poverty.[11] Already desperate people become even more desperate and may resort to previously unimaginable actions in order to put food on the table and ensure survival.[12]

WANAME Disproportionately Suffers From Climate Change Effects, Poverty, and Conflict

In coming decades, the most volatile conflict areas will come at the nexus of heat, water scarcity, and poverty. West Asia, Northern Africa, and the Middle East are most vulnerable to this particularly deadly combination. The Middle East and North Africa alone have only 2 percent of the world's renewable water resources—far below the level needed to supply its residents in the years to come.[13] Twenty-six of the 33 most water stressed countries are part of the WANAME region,[14] many of which overlap with the countries labeled as the most fragile by the Fund for Peace[15] and the countries that have a large share of the population living in poverty or extreme poverty by the World Bank's definition.[16] Because the key resiliency factors against climate change include the ability to maintain critical infrastructure and stockpile food and water,[17] the combination of these effects makes the WANAME region the world's most vulnerable and least resilient victim to the mounting first-, second-, and third-order effects of climate change. To examine some of the key ripple effects of climate change across this region, this report assesses four case studies which showcase some of the most severe and diverse impacts of climate change and conflict in WANAME countries including Syria, Iraq, Afghanistan, and the Lake Chad region.

Syria provides both a historical case study and a contemporary reminder of the potential magnifying effects of climate change on conflicts. The Syrian civil war[18] came on the heels of the worst drought in at least 500 years,[19] which drove high domestic immigration to city centers[20] as the agricultural sector—once accounting for nearly 20% of employment[21]—collapsed.[22] Syria later became overrun by ISIS,[23] making it an unfortunate model case study for understanding the amplifying effects of climate change on an already unstable country.

The **Iraqi** case study highlights the impact of terrorist organizations (again ISIS[24]) in the wake of climate change stress in a young, underdeveloped democratic structure which is unable to adequately handle the onset of multiple kinds of crises at once.[25] Iraq is the 21st of the 33 most water stressed countries,[26] and one third of the poorest people in Iraq survive in the agricultural sector as nonwage workers who cannot feed themselves without agricultural jobs.[27] As the agricultural sector is shrinking, Iraq will continue to face economic stress from unemployed and impoverished rural farmers.[28] Iraq's reliance on the agricultural sector, in addition to the transboundary water issues it is facing with Iran and Turkey,[29] provides an important illustration for understanding the impacts of climate change across national borders.

Afghanistan is the world's 12th most impoverished nation[30] and is actively recovering from prolonged, intense conflicts which have prevented good governance and destroyed internal

infrastructure.[31] It is the 31st most water-stressed country,[32] but not necessarily for the lack of water resources; rather, for the lack of infrastructure to preserve the water resources Afghanistan does have.[33] Attempts to preserve the state's own water resources are leading to flareups with bordering countries including Iran and Pakistan.[34]

The **Lake Chad** region incorporates the African countries of Chad, Niger, Nigeria, and Cameroon.[35] Lake Chad provides most of the water to the region, but over the last 50 years the surface area of the lake has decreased by almost 90 percent and subsequently the aquifer has also decreased significantly as the region relies more heavily upon it for water resources. In addition, extreme drought has rocked the region and the lake has become a sanctuary for a growing number of drought refugees.[36] The terrorist organization Boko Haram has made Lake Chad its home base, and the conflict between national governments and the terrorist group has led to even more refugees becoming displaced across borders, with very little cooperation between countries to address either the climate or terrorist crises.[37]

These four case studies provide a rich array of the diverse human security impacts that can be second- and third-order effects of climate change and offer a vivid context for assessing other compounding factors like government mismanagement and the effects of mass migration—forces both driving and deriving from climate change.

Government Mismanagement of Conflict and Agriculture Exacerbates Climate Change Effects

Climate change does not deliver negative impacts in isolation; it works in concert with other factors that can ameliorate or exacerbate its effects. Unfortunately, several of these factors—foremost government mismanagement and migration—have a pronounced effect in exacerbating the impact of climate change in the WANAME region. Two key types of government mismanagement can ultimately lead to climate change impacts hitting harder on the poorest populations: first, governments may mismanage terrorism or other localized conflicts, leading to population mistrust and an inability for the government to make meaningful steps towards mitigating climate change effects as they begin to be apparent; and second, governments may mismanage the unfolding climate change impacts themselves as they are in the midst of them.

Government mismanagement of terrorism and other civil conflicts leads to population mistrust and subsequent mishandling of climate change effects as showcased in the Lake Chad region. Until recently, Boko Haram has been the most pressing threat to the Lake Chad region (Chad, Cameroon, Niger and Nigeria).[38] A coordinated effort has not been developed across the four countries to address the extremism problem.[39] Instead, each country has designed and implemented its own tactics—prominently including use of indiscriminate violence against the civilians living near Lake Chad[40]—to manage the problem, which has resulted in additional mass displacement of populations. Studies show that government use of indiscriminate violence is much more likely to backfire on the government, endearing populations to the terrorist group which they see as less destructive and more benevolent by comparison.[41] This means that when governments need civilian cooperation to attempt to ameliorate the effects of climate change, civilians are reluctant to trust and cooperate with the government. Climate change effects then impact populations much more directly and harmfully as the preemptory measures that could

have been taken or were attempted on the part of the government were resisted or simply not adopted by an untrusting population.

Government mismanagement of rising climate issues has been even more rampant and devastating to the agricultural sectors of Syria, Iraq, and Afghanistan. In Afghanistan, the national government was not functionally in existence for much of the last thirty to forty years, which means that there was no central governance over water infrastructure or restriction against overuse of groundwater resources.[42] Government mismanagement in the form of failed oversight or the simple inability to act due to a lack of resources or specialized knowledge has led to 63 percent of Afghanis being unable to access clean drinking water.[43] The lack of water infrastructure to catch snowmelt and preserve water from the rivers that originate in Afghanistan means that 70 percent of the water in Afghanistan is lost downstream and to evaporation.[44]

Iraq suffered particularly from government mismanagement early on in its post-1950 history, which is now causing impacts at the same time that climate change stress is getting worse. Iraq's government promoted the overuse and misuse of certain chemical fertilizers, which over time lent to the speed of soil salinization and the contamination of water resources.[45] When several of these crises came to a head in 2018 as drought and the lack of irrigation water dried up much of the available farmland, the Iraqi government banned the planting of certain crops which require vast amounts of water, such as rice and cereal crops.[46] However, banning these crops was an effort which came too late and resulted in a new kind of negative mismanagement results. Because so many Iraqis rely on water-dependent crops for food—and few alternatives were suggested—food insecurity was worsened in the effort to ameliorate water insecurity.[47] Either of these results causes the most desperate populations to become more desperate, and the government's attempts at the eleventh hour to ameliorate sins committed early on may not meaningfully aid the effort to become more resilient against climate change effects. In other attempts to budget water resources, some farmland has been left uncultivated for years, which allows desertification and salinization to set in, making that land unrecoverable for future use.[48] The Iraqi government's further inability to negotiate with northern neighbors[49] withholding water flows also leads to the increased salinity of the water flowing downstream and compounds adverse effects on livestock—in some cases, the water even becoming so salinized that livestock have been blinded by the toxicity.[50]

Syria faced a similar circumstance with respect to early government mismanagement bringing about an inability to effectively combat more recent climate change stress. The Syrian situation came about initially because the 1980s Ba'ath party encouraged the planting of water-dependent crops such as wheat and cotton through the use of monetary incentives in an attempt to achieve a Maoist-inspired level of self-sufficiency.[51] This led to the use of wasteful irrigation techniques and crops which are unable to retain effectiveness under drought conditions, especially as 70 percent of the cropland in Syria is rain-fed.[52] This led to a crop yield decrease of 40 percent during one year of drought[53] and an increase in food prices by as much as 75 percent.[54] The Syrian government continued to encourage the planting of unsustainable crops and ignored many of the signs of a slowly collapsing agricultural sector in favor of ongoing support of its most elite populations.[55] Additionally, there was a 2005 law which prohibited the unlicensed creation of wells, which was an attempt to prevent the overdrawing of groundwater

resources;[56] however, this law was either unenforced or used to extort the poorest populations, increasing distrust of and dislike for the government.[57]

One of the universal sins of government mismanagement in arable and semi-arable regions is the use of archaic irrigation techniques which waste up to two-thirds of the water used.[58] This overuse of water drains country resources, especially when those countries are also unable to provide clean water to their populations. More water-conscious irrigation systems exist and could be implemented, but most have not been seriously explored by these governments; instead, they continue to advocate for the use of systems which will be hard hit by climate change effects.[59] Drip irrigation, specifically surface drip irrigation, is widely heralded as more efficient[60] (only 15 percent water waste compared to the 70 percent water waste of traditional irrigation).[61] Drip irrigation does have some barriers to use in poorer countries, such as cost of the physical infrastructure and expertise in the use of the systems, but with investment from state governments and international organizations, significant and far-reaching improvements could be made to irrigation systems.[62] Improving irrigation could potentially preserve many agricultural jobs and help mitigate the threat of sudden widespread unemployment which fuels migration and extreme poverty.

The states most vulnerable to climate change stress must also adopt a more strategic approach on the crops they incentivize the agricultural sector to produce. Especially in the arid and semi-arid climates of the WANAME countries, governments cannot realistically depend on or promote the cultivation of rice and other water-hungry crops. This will require these countries to be more dependent on trade for certain staple crops, which is a condition that creates understandable discomfort. But promoting water-conserving crops that will grow well in local climates and soil types and that will trade well will be much more beneficial in the long term rather than stumbling headlong into widespread food scarcity, which seems likely to be the future in many of the most vulnerable areas if no policy changes are made.

Finally, nations must develop and enforce strict rules about tapping into groundwater resources. As they are only semi-renewable when being withdrawn at a slow rate, and completely unrenewable as withdrawal rates increase, groundwater resources are increasingly vulnerable to human exhaustion.[63] Protection of these valuable water resources is crucial if endangered populations are to continue to survive when surface water becomes rarer. Actively supporting development of alternative methods of accessing water will be of key importance along with the enforcement of groundwater regulation rules, as the implementation of laws alone will not prevent desperate people from violating rules meant to preserve critical resources.

Economic- and Environment-Driven Migration Further Catalyzed by Climate Change Impacts

Migration holds an interesting place in the matrix of climate change effects as it is both a byproduct and an impact multiplier of the shifting natural environment. In conjunction with poor government management, migration causes severe institutional instability due to concentrations of unstable populations, which can lead to large-scale unrest and ultimately violence. In addition, migration comes as a result of the loss of agricultural jobs. As climate change worsens, rural economic migrants flood to cities hoping to find employment, but jobs, food, and water soon become progressively more scarce and compound the desperation of these populations.

In the 1990s, the stable population of the Lake Chad region amounted to around 13 million people.[64] Just two decades later the population had grown to over 38 million people, as the lake is one of the few remaining consistent sources of freshwater and subsequently viable communities and jobs.[65] With the rise of the terrorist organization Boko Haram, conflict migration has ballooned on top of economic migration. Since the acceleration of conflict driven by Boko Haram, poverty in the region has risen from 55 percent to 60 percent,[66] and 2.4 million people have been displaced not only from their home towns but from their home countries.[67] Additionally, the conflict has put at least 7 million people at risk of starvation.[68] The migration of these individuals, for whatever motive, makes battling the Boko Haram insurgency more difficult because the insurgents look like, and sometimes are, the impoverished people of the region.[69]

The Syrian government also experienced a flood of rural refugees coming to urban population centers as a result of mismanaged physical infrastructure and agricultural sector collapse.[70] The influx of economic migrants from rural Syria from 2006-2008 (approximately 1.5 million)[71] followed an influx of refugees fleeing conflicts in Iraq (1.2-1.5 million)[72] and Palestine (.25 million).[73] Syria's water infrastructure was already in poor shape, sometimes losing as much as 60 percent of the water en route due to system failures.[74] Physical infrastructures were also inadequate to provide shelter for all new refugees and led to many building tent cities outside of city boundaries which were unable to adequately shelter citizens from the elements and became hotbeds for social unrest, increasing poverty, and growing government discontent,[75] as evidenced by the informal markets along city streets becoming more persistent and desperate.[76]

Syria's government endeavored to provide some conditional aid, meaning they offered small bribes for citizens to return to rural lands where there were absolutely no jobs. These aid attempts only served to deepen mistrust of the government.[77] In Syria's case, migration as a partial result of climate change effects contributed to a circular compounding of social unrest and anger with the government, to the degree that when protests began as part of the Arab Spring, the population was primed to fight against the government.[78] Syria's experience with climate-influenced migration is a classic example of how climate change may not necessarily begin conflicts or sit at the root of all societal discontent, but climate change does complicate these effects and often causes them to become worse than they otherwise would be.[79]

Resiliency in the face of migration is difficult to cultivate. Governments cannot always stimulate job creation on behalf of those who are now jobless. However, nations can learn from Syria's failed attempt to bribe citizens to return to their unsustainable rural lives and instead work to improve the living conditions of those who have migrated out of necessity. One challenge created by mass migration is that migrants are often in close and poorly constructed quarters where it is easy for dissatisfaction and unrest to gestate and become full-scale upheaval if the government is not showing effort to aid those in direst straits. Governments are likely to gain far more ground in negotiating the challenges of climate-driven migration by offering urban job retraining, upkeeping urban infrastructure, and seeking to integrate domestic and transnational migrants rather than marginalizing them. These are tall orders for even rich countries, much less the predominantly poor nations of the WANAME region. But seeking to progressively focus government policy and even limited resources around these aims provides a template for starting to mitigate and adapt to the reality of rising climate-driven migration in coming decades—particularly as extremist organizations seek to leverage the climate crisis to their own ends.

Terrorist Groups Exploit Climate Change-Induced Economic Desperation and Water Scarcity

In recent years, the loss of jobs in the global agricultural sector and increased desperation on the part of the rural unemployed has led to the increased vulnerability of populations to terrorist recruitment based on non-ideological motivators. Additionally, terrorist organizations are becoming adept at leveraging access to and control over water sources in order to achieve military goals. On the whole, terrorist organizations are becoming much more skilled in adapting to the impacts of climate change and using them to their advantage than governments are.

Economically-motivated allegiance to terrorist groups such as ISIS or Boko Haram remains a less common phenomenon than ideological loyalty, but there is evidence that many terrorist organizations are using the growing economic hardship of agricultural workers to convince the region's poorest individuals to fight for a terrorist group they would otherwise oppose or ignore based on ideology. In Iraq and Syria, ISIS entered cities after particularly bad growing seasons and sought out the most obviously poor and desperate agricultural workers, courting them with promises of a living wage and food for their families.[80] ISIS often had already ingratiated itself in towns by showing up after particularly extreme climate-induced weather events bearing gifts of much-needed supplies, which served as a method for building trust with the Iraqi civilians it would eventually recruit.[81]

In Africa's Lake Chad region, Boko Haram has similarly leveraged stress from climate change impacts and resulting dissatisfaction from poor government responses to fuel recruitment.[82] During 2015-2016 the United Nations Development Programme (UNDP) conducted interviews with an "unprecedented number of … former recruits" to African terrorist organizations[83] which primarily included Boko Haram and Al-Shabab.[84] These interviews provide startling insights into the main motivators for people joining these extremist groups. For instance, 71 percent of recruits interviewed identified a government action as the trigger which caused them to join an extremist organization in the first place.[85] Many of these individuals also cited their "most immediate need" as employment at the time of recruitment.[86] Forty-two percent of voluntary recruits were unemployed at the time of involvement with their organization—employed or school-enrolled individuals were found to be between 3 and 27 percent less likely to voluntarily join the terrorist group.[87] Youth remain especially vulnerable to economic recruitment because the unemployment rate in their age category is upwards of 50 percent across the African continent, leaving them in dire economic straits and with few meaningful prospects.[88] On the whole, the UNDP report showcases the economically-motivated terrorist, demonstrating that most of these voluntary insurgents were both without a job—usually in rural agricultural areas now producing lower yields than previous years[89]—and driven to desperation by government mismanagement of conflict situation and economic infrastructure.

Many of the interviewees in this study were available for interview because they voluntarily left the organization of which they had been a part, having become disillusioned with the goals of these organizations since their primary motivation for joining was not ideological. Some who were promised a paycheck never received one, or the terrorist group purportedly had them engage in actions with which they were not fully comfortable.[90] In cases such as these, former members of terrorist groups are left floating: struggling to reintegrate into society, particularly in the Lake Chad area, with few effective or established methods for doing so.[91]

Resiliency against terrorist recruitment of the poorest populations comes in many forms, but the most important element is rebuilding and maintaining trust in formal governments over terrorist organizations. In the UNDP interviews, insurgents were asked about preventative campaigns (a resistance technique which laid out a case against joining a terrorist organization) and many noted that while they had seen these campaigns they elected not to listen to them because they did not trust those delivering the program (the government).[92] In times of desperation, populations naturally ally themselves with the people and entities they trust—if governments counter terrorist threats by using indiscriminate violence against civilians and repeatedly ignore the concerns brought to them by rural citizens, the risk of members of the population allying themselves with fringe elements increases exponentially, complicating efforts to address both issues of civil violence and larger natural threats from climate change.

Additionally, it is important to find the balance in creating space for reformed insurgents who may not have been ideologically motivated and wish to rejoin society writ large. In these cases, governments may benefit from developing rehabilitation and societal reintroduction plans that can garner critical popular support; this could take on a similar structure to the Rwanda Demobilization and Reintegration Commission (RDRC).[93] RDRC has largely been successful at reintegrating former Rwandan combatants through the DDRRR method: Disarmament, Demobilization, Repatriation, Reintegration and Resettlement.[94] Former combatants voluntary elect to join the program, which places them in a demobilization camp for three months before providing them the tools and opportunities to reintegrate into society and find employment. While the program has faced challenges, especially with respect to community acceptance of the reintegrated combatants, overall the program has seen success.[95] Similar programs could be instituted in the WANAME region for economically-motivated terrorists, providing an avenue for individuals to return to society, decrease unrest and violence, and productively leverage their disillusionment with terrorist groups to help inoculate against other non-ideologically motivated recruits to extremist organizations.

Terrorists Weaponize Water in Face of Climate Change Induced Water Scarcity

Terrorist organizations are utilizing climate change effects not only as a recruitment tactic but as a combat leverage point. Across the Middle East and Northern Africa, terrorist groups have held water hostage or polluted crucial sources of water, knowing that this would back state governments into a corner and elicit desired responses. Extremist groups have shown themselves to be very aware of societal vulnerabilities, and as water supplies dry up, dams, reservoirs, and natural aquifers will more frequently become the sites of attacks or hostile seizure. Water is becoming a potent weapon of war.

The weaponization of water was normalized by ISIS in Iraq and Syria, where it centered its strategic movements around water. ISIS demonstrated both strategic weaponization—the use of water to control territory or facilities in an act of sovereignty or to fund conflict activities—and tactical weaponization—the use of water on the battlefield as a supplementary weapon against military operations and targets. Significant actions taken by ISIS were focused on controlling or sabotaging existing water infrastructure. ISIS was able to gain control of Mosul Dam—the source of most of Iraq's hydroelectric power, which is also lacking sound structural integrity—for a

month, during which time many were afraid that the group would sabotage the infrastructure and flood thousands of vulnerable people downstream.[96] Later, ISIS took the Ramadi Barrage, which controlled all water downstream, providing opportunities to move troops more efficiently. ISIS also used its control of the Fallujah Barrage to flood counter-forces downstream and halt their advancement. Control over water sources has forced civilians out of their homes due to artificial droughts. ISIS fighters also attacked critical water pipelines which deprived major cities of water, including Baghdad. Many of the same tactics were also pursued in Syria, except ISIS was successful in holding many of the crucial dams in that country, severely limiting water to major government strongholds like Aleppo and reserving water for its own capital in Raqqa.[97]

During ISIS's retreat, the group adopted a scorched earth policy which included poisoning water sources in order to ensure that those who took back control would not benefit from the water resources.[98] Boko Haram has adopted the same approach to weaponizing the limited water resources surrounding Lake Chad, poisoning some water sources such as streams and wells in order to render them useless to the forces pursuing them.[99] The devastating collateral effect of this is the impact on ordinary citizens and their livestock. Where terrorist groups have controlled or poisoned water resources, waterborne illnesses such as cholera, typhoid, polio, hepatitis, and diarrhea are much more likely to become a problem in adjacent areas.[100] As freshwater becomes scarcer in progressively hotter climates, control over dams, barrages, and other water sources and flows will become even more critical. These sites will become battlegrounds of the warming world, and protecting and reinforcing them both structurally and with protective forces will become even more crucial to shore up resiliency against terrorist groups and to ensure equitable access in the face of competing claims from neighboring states.

Hydrodiplomacy Necessary to Prevent Conflict as Global Water Scarcity Worsens

Sixty percent of the world's freshwater is found in 263 cross-border lakes and rivers within 145 countries. These cross-border water resources supply two fifths of the world's population with water, and a further two billion people are dependent upon cross-border aquifers.[101] Most of these cross-border water resources do not have any kind of international treaty or cross-border water-sharing agreement between adjacent nations.[102] The continent most at risk of water resource-related conflict is Asia, as 70 percent of the world's irrigated land is within this region,[103] which relies on 57 transnational river basins—only four of which have any sort of treaty attached to them.[104]

The lack of transnational water-sharing agreements denies those countries which are downstream from water-stockpiling states an avenue to advocate for their own citizens. In 2018, during one of the worst years of recent drought impacts, Iraq's situation was worsened because Iran and Turkey built dams which severely limited the flow and increased the salinity of the water coming downstream.[105] At the height of the crisis, Turkey elected to release some water in order to aid suffering Iraqis, but this was done out of the goodness of Turkish will—a decision just as easily reversed in a moment of less political favor.[106] There is no agreement ensuring that the water from the Tigris and Euphrates is at least somewhat equally distributed in the countries through which the rivers flow. Because there is no agreement, there is no specialized diplomatic avenue through which Iraq can advocate to regain some of the water that should come to it.[107]

Instead, Iraq is reduced to suffering through drought, or begging for water which in previous years had belonged to it.

On the supply side, Afghanistan lacks water-sharing agreements with its neighbors Iran and Pakistan, an issue compounded by the waste caused by poor Afghan water infrastructure. Due to the long conflicts that have dominated Afghanistan for decades, most critical infrastructure in the state has been largely nonexistent;[108] however, as a relative measure of stability has been found in recent years, the Afghan government is turning its attention the long-neglected issue of water infrastructure.[109] Afghanistan struggles with both drought and flooding, each of which have become more severe as climate change has caused less snow, earlier snowmelt, and a longer, hotter growing season.[110] However, there are no dams or reservoirs in place to be able to regulate and preserve Afghan water resources, which may be sufficient to sustain the population if properly managed. The Afghan government has started to fund several dam and reservoir construction projects to address this inadequacy in its own system.[111]

Between Afghanistan, Iran, and Pakistan there is only one water treaty—the Treaty of Helmand (1973)—signed by Iran and Afghanistan with inadequate and largely unclear terms.[112] Iran has gotten approximately 70 percent more water than the amount stipulated within that treaty,[113] clearly indicating that the Treaty of Helmand will not be an adequate mechanism in ameliorating cross-border water conflicts between Iran and Afghanistan. Additionally, Afghanistan and Pakistan have been encouraged to sign water-sharing agreements several times but have never been able to agree on terms.[114] Without water-sharing agreements in place, Afghanistan's attempts to adapt to the climate changes by preserving its own water resources will backfire, and some efforts already have. Several water infrastructure construction sites have been sabotaged in the last year, which have been attributed to both Iran and Pakistan. If these sabotage attempts were carried out by these two state actors, it would speak to their insecurity over the reduced amount of water they will receive once Afghanistan has functioning water infrastructure.[115]

As these cases illustrate, transboundary water-sharing agreements and an open dialogue for hydrodiplomacy will become crucial aspects of climate change resilience as water resources become further depleted. Unpoliced, these trans-boundary water resources will become the nexus of conflict within the next several decades because there is no currently dedicated space for discussion and conflict resolution on this issue. The silver lining of this bleak topic is that history does hold some prominent instances of water disputes being peacefully resolved through some type of agreement; thus, there is hope that hydrodiplomacy can succeed.[116] Additionally, Afghanistan's experience is an important reminder that as nations build their own resilience in the face of climate change, the resources used are global—and therefore the resilience conversation must take place on a global level. If one state's resilience negatively impacts its neighbors, then true, sustainable resilience against climate change has not been created. Hydrodiplomacy across the world must become a more central part of national and international negotiations, especially as freshwater resources dwindle, or else nations will find themselves confronting both global water sabotage and escalating transnational conflict.

Climate Change: A Threat Multiplier

From a security standpoint, climate change is best understood as a threat multiplier. As the impacts of increased global temperatures and decreased rainfall impact already desperate regions, climate change will pick at existing societal wounds—driving them to fester faster and more furiously than they otherwise would.

When multiplied by gross government mismanagement in some of the world's poorest regions, the effects of climate change ultimately lead to the loss of jobs and the deepening of poverty. When multiplied by migration and collapsing agricultural jobs, climate change impacts can aggravate unrest and exacerbate societal disintegration. When multiplied by extreme poverty and the presence of terrorist organizations, climate change can produce growing numbers of a tragic type of terrorist recruit: one who is economically motivated and has few or no ideological ties to their organization and its bloody methods. When multiplied by terrorist groups' motivations and strategies, climate change impacts provoke the seizure of crucial water infrastructure or the poisoning of essential freshwater resources. When multiplied by a lack of communication between nations, climate change can lead to state-on-state conflict which could have been lessened or prevented by the existence of a transboundary water-sharing agreement.

Climate change as multiplied by any number of critical issues will create challenges that are deeply difficult to solve. The global community is entering critical territory—the climate-induced issues that will face us in the next 50 years will disproportionately impact the poorest populations, those least prepared and least able to prepare in the face of advancing climate change. It is in the best interest of the global community to begin to seriously address the issues of climate-driven water and food scarcity now, before extreme poverty, joblessness, and desperation stoke the civil and transnational conflicts of the future.

Endnotes

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