

Climate Change Makes Success in U.S. Strategy Harder to Achieve

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Introduction

The United States is in a period of relative decline. This comes as no surprise to followers of global economic and political trends. America's growth rate has slowed to a mere 2 percent for long-term projections, and even though rivals like China have also suffered from slowing growth, they maintain a strong 6-plus percent rate of growth.¹ Similarly, despite massive investments in weapons superiority, American dominance is being increasingly challenged as technology gaps close. America will still be number one for quite some time, but the era of American primacy where U.S. interests went virtually unchallenged is nearing an end. This has raised serious questions and concerns as to the proper long term strategy, since protracted commitment to indefensible interests would only accelerate U.S. decline.

A key question that has received little recognition in this argument is the climatic effect on the resource nexus, and how that will impact U.S. interests. There has been no shortage of literature on the potential impacts of climate change, but very little of it covers the role of climate change in a grand strategy that acknowledges U.S. decline. When imagining the challenges that we have been facing over the past decade in Afghanistan, Iraq, Yemen, Syria, and Libya, there is a serious question of just how much more difficult these engagements could have been in a four-degree warmed world. If we consciously accept that such events would raise the costs of engagement, and that we have finite resources to invest in our international engagement, then we are also led to the conclusion that climate change will impose constraints on our strategy.

The key concern, then, is the relative impacts of climate change on U.S. interests compared to those of other great powers. The U.S. is relatively well insulated from the effects of

¹ International Monetary Fund, *World Economic Outlook*, (January, 2016).
<http://www.imf.org/external/pubs/ft/weo/2016/update/01/>

climate change, and operationally the impacts can be easy to adapt to. The question is more or less what areas of interest does the U.S. have that will be affected by climate change, and to what degree? Just by virtue of the fact that U.S. primacy has been predicated on a high level of engagement globally, the U.S. is more likely to be engaged in regions where climate change raises engagement costs, and erodes traditional advantages.

In identifying these risks, there are interesting cases, particularly in Africa. Climate change alone is not a serious threat to people, rather it is the combination of increasingly intense climatic events combined with inadequate societal responses that creates the most devastating consequences. Many nations in Africa have a history of poor environmental policies that have exacerbated human-induced degradation, which then leads to resource scarcity. Even though Africa does not have a higher vulnerability to the effects of climate change than other areas in the world, we are more likely to see the long term consequences manifested there first, as governments are unable to forestall the effects of climate change. Observing past and present environmentally-related conflicts can showcase the probable consequences elsewhere in the future.

A comprehensive U.S. strategy should consider not only the trajectory of military power over the coming decades, but also if environmental factors will raise the costs associated with traditional strategies of engagement. The principal challenge that we face in defining this strategy is that we lack the necessary information to deliver informed policy decisions. In crafting a grand strategy for America, all potential variables must be given due consideration. A better understanding of climate change and resource scarcity can help us gauge where conflicts are likely to arise, what the likely solutions are, and how our allies and rivals are likely to be affected.

The Issues

The rate of economic growth in the U.S. has slowed relative to that of the rest of the world. Real GDP growth is pegged at 2 percent, while China, India, Iran, and many other countries have growth ranging between 3 and 7 percent.² The only possible rival that the U.S. continues to outpace is Russia, but that is largely a product of fallen oil prices—not superior economic growth.³ Economic size is a crucial measure for gauging the amount of resources a country can dedicate to weapons research and development, equipping armed forces, and developing the means to project power and influence. America’s anemic growth paints a grim picture, as it appears to be only a matter of time before other countries achieve parity with the United States.

Twenty years ago, it was difficult to ever believe that this could be the case. The U.S. had a massive economy with strong growth. It had a well-funded defense budget, and was the home of the best education and economic institutions in the world. America was on top, and more importantly, would be on top for the foreseeable future. That statement no longer holds true today, and the closing power gap is forcing the U.S. to be increasingly considerate of the interests of other nations. Twenty years ago, the U.S. most likely would not tolerate the gross violations of (American defined) international law. Russia’s annexation of Crimea, and China’s audacious claim to the entirety of the South China Sea are the most egregious examples, but there are many more instances of international politics not delivering a favorable outcome to the U.S.

² Ibid.

³ Ibid.

Russia's invasion of Ukraine, Russia bombing U.S. backed rebels in Syria, Turkey accusing the U.S. of having a hand in a failed coup attempt, Turkey assailing U.S.-backed forces in the fight against ISIS, and other events are demonstrative of a gradual erosion of U.S. primacy. America does not enjoy the deference it used to have, and all indications are that things will only get worse. The U.S. still enjoys a period of unrivaled geopolitical strength, but a strategic vision should focus on preserving that power.

To this effect, realists are already discussing the proper direction of U.S. strategy after primacy. Marc Genest and James Holmes write on the importance of "strategic triage" for the United States, likening the distribution of resources to a doctor prioritizing patient treatment to avoid administering aid to lost causes.⁴ There are almost always incentives to become more engaged in conflicts, but maintaining dominance means avoiding the temptation of pursuing engagements that may hold more risk than reward. While Genest and Holmes give examples of current engagements that should be subjected to strategic triage, there is evidence that U.S. leaders are moving towards this line of thought. America avoided deepening its involvement in Ukraine by refusing to supply weapons to pro-Western forces, and has so far avoided a complete military commitment in the fight against ISIS.

A chief concern among these conflicts where U.S. investment has failed to yield swift and favorable results is that they are defined by their asymmetric nature. Combatants that are able to punch above their weight in terms of cost expenditure, or building military targets that are destroyed by bombs more expensive than the target, represent a lack of parity in the investment required on the part of the U.S. and its opponents. A notable example of this is the United States'

⁴ Marc Genest and James Holmes, "Welcome to the Age of Strategic Triage," *The National Interest*, (August, 2016: Washington, D.C.). <http://nationalinterest.org/feature/welcome-the-age-strategic-triage-17450>

failed \$600 million program to train Syrian rebels, which only yielded around “4 or 5” trained fighters.⁵ The traditional strategies of the U.S. to rely heavily on superior equipment, technology, and training means that the longer the U.S. is engaged in asymmetrical conflicts, the bigger the disparity in resource investment.

The reason such a disparity of investment is worth noting is that climate change is likely to yield battlefield environments that favor asymmetric tactics. The very form of warfare that America has struggled to achieve dominance in over the past fifteen years is only likely to become more common in the future. When we consider this in addition to America’s relative decline in conventional warfare, a seriously disadvantaged U.S. becomes a possibility over the long term. This, combined with the concept of strategic triage, is where climate change can become strategically important.

If climate change yields battlefield environments that are favorable to asymmetric warfare, and asymmetric warfare is likely to become more prevalent in U.S. engaged conflicts, then America has the potential to misgauge the level of risk that conflicts may entail. We are already coping with the issue that U.S. investment in several conflicts has exceeded the beneficial outcome—indicating a poor assessment of risk—and low information on climatic conditions make this an increasingly likely problem.

To this end, this paper will focus on explaining how climate change creates conditions that favor asymmetric warfare, showing examples of how poor social preparedness for climate

⁵ Spencer Ackerman, “US has trained only ‘four or five’ Syrian fighters against Isis, top general testifies,” *The Guardian*, (September, 2015: New York). <https://www.theguardian.com/us-news/2015/sep/16/us-military-syrian-isis-fighters>

change can make conflict more likely, and provide general recommendations for improving our ability to gauge climate-related security risks.

What is Climate Change?

Climate change is the technical term for the effect of greenhouse gases altering the climate. Greenhouse gases are important to the world—without them, no life would exist on the planet. They trap heat from the sun in the atmosphere, preventing our planet from being a giant ball of ice. Most greenhouse gases are naturally occurring, but some can be produced by human activity as well. The burning of coal for a power plant generates carbon dioxide (CO₂), the extraction of natural gas creates methane emissions, and so on. Since the 1980s, there has been a growing concern that greenhouse gas emissions from human activity is increasing the amount of heat trapped in the atmosphere. Colloquially this had been called “global warming,” but such a term inaccurately depicts the effect of greenhouse gases, since not everywhere becomes warmer as a result of heat trapped in the atmosphere.

The impact of anthropogenic climate change (a term specifically referring to human-induced climate change) manifests itself in three key ways: sea level rise, increased intensity of climate-related natural disasters, and a higher likelihood of droughts. Sea level rise occurs because hot water literally takes up more space than cold water, via a process known as thermal expansion. Politicians relish pointing to sea level rise as a significant threat that could potentially put major cities underwater. In *An Inconvenient Truth* Al Gore claimed that sea levels would rise by 20 feet by the end of the century.⁶ Such predictions far exceed those made by the most

⁶ Gore, Al. *An inconvenient truth: The planetary emergency of global warming and what we can do about it*. Rodale, 2006.

credible climate science body, the Intergovernmental Panel on Climate Change (IPCC), which predicts somewhere between 1.5 feet and 3.2 feet of sea level rise by 2100.⁷ The fact of the matter though is that we simply *do not know* enough to accurately predict sea level rise, but we *do know* that the threat of sea level rise is not limited to the obvious threat to coastal or island infrastructure. Also, some of the areas most at risk to sea level rise—such as river deltas—are most important for food production. Sea level rise makes major floods more common, and increases the threat of storm surge that could damage property.⁸ Just how much sea level rise will contribute to that is difficult to determine at this time.

Similar to how sea level rise can make storm surges worse, climate change will affect the intensity of major storms. Warm water produces stronger hurricanes, and some of the strongest storms ever on record happened in 2015, the hottest year on record. In February of 2015, Hurricane Patricia smashed records with sustained winds of 215 miles per hour, 25 mph greater than 1980's Hurricane Allen.⁹ A month later, the second most powerful storm in the South Pacific ever, Cyclone Pam, hit Vanuatu. In November, Cyclone Chapala made an extremely rare landfall in Yemen—the first in 55 years. Although Chapala was only a category 1 storm, it delivered a full year's worth of rainfall in a single day to Yemen, causing significant flooding.¹⁰ In fact, the number of “named storms” has been steadily increasing along with CO₂ emissions. The statistical probability of a false positive is near 0.00 (this does not represent a causal

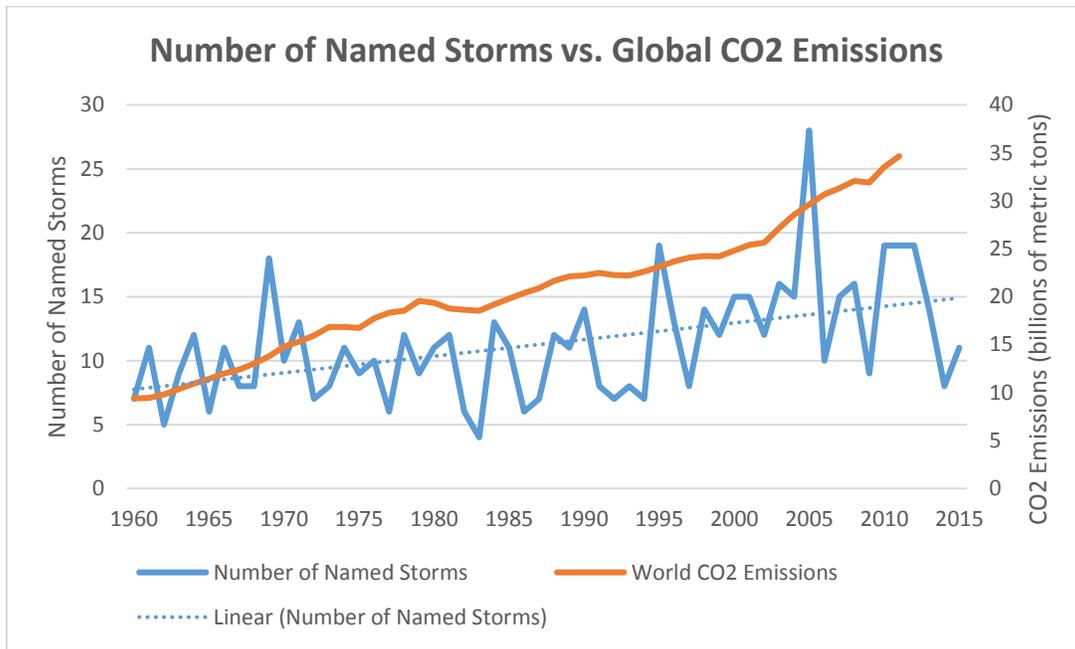
⁷ Climate Change 2013: The Physical Science Basis, United Nations, Intergovernmental Panel on Climate Change https://www.ipcc.ch/pdf/unfccc/cop19/3_gregory13sbsta.pdf

⁸ Pachauri, R. K., and A. Reisinger. "IPCC fourth assessment report." *IPCC*, (2007: Geneva).

⁹ National Oceanic and Atmospheric Administration http://www.nhc.noaa.gov/data/tcr/EP202015_Patricia.pdf

¹⁰ *Extremely Severe Cyclonic Storm, Chapala over the Arabian Sea (28 October - 04 November 2015): A Report (Report)*.

relationship) in a bivariate linear regression. It makes sense that increasing greenhouse gas levels could raise water temperatures, and consequently increase storm intensity.



Source: NOAA storm data, World Bank emissions data.

Droughts are perhaps the most serious consequence of climate change, because they directly impact the availability of two critical resources: food and water. The evaporative capacity of air—how much water vapor it can hold—is determined by its temperature. Hotter air holds more water vapor, and colder air holds less of it.¹¹ Most people experience this as they have humid days in the summertime, but dry days in the wintertime. That moisture has to come from somewhere, and usually it comes out of the ground and the plant life. Naturally, more water in the air also leads to more rain, but because of the movement of clouds, water is basically

¹¹ NASA, Water Vapor Confirmed as Major Player in Climate Change, 2008. http://www.nasa.gov/topics/earth/features/vapor_warming.html

removed from one location and placed in another. This is why climate scientists often say that dry areas will get drier, and wet areas will get wetter.¹²

As a consequence of this warmer air, the regions which are most important to agriculture are also more likely to experience droughts.¹³ The “mega-drought” that plagued Syria from 2005-2011 was considered to be about 2-3 times more likely to occur as a result of climate change.¹⁴

The caveat to climate-related disasters though is that, for all of our expectations of the impact of climate change, there is no one event—past or future—that we can point to and say was caused by climate change. Part of this is just the nature of climate change, since it may make specific weather events more frequent or intense, but it is impossible to say whether or not they would have occurred without human-induced climate change. The other part is that the most serious impacts of climate change are as impossible to predict as any other weather pattern. It is outside of our technological capability to perfectly model the weather within twenty-four hours, let alone twenty-four years. The randomness of weather related events makes it impossible to isolate any event as being solely caused by climate change. However, it is not unreasonable to say that climate change will make more serious weather events more prevalent.

Another issue to keep in mind is that it is not the job of climate scientists to gauge consequence. Climate scientists may be able to say that a certain storm is more likely to occur in a given year, but how much damage is done by that storm is ultimately determined by human

¹² Liu & Allan (2013) Environmental Research Letters, 8, 034002, [doi:10.1088/1748-9326/8/3/034002](https://doi.org/10.1088/1748-9326/8/3/034002)
Allan et al. (2013) Surveys in Geophysics, [doi:10.1007/s10712-012-9213-z](https://doi.org/10.1007/s10712-012-9213-z)

¹³ Brown University. "Impact of climate change on agriculture may be underestimated." ScienceDaily. ScienceDaily, 7 March 2016. www.sciencedaily.com/releases/2016/03/160307112943.htm

¹⁴ Kelley, Colin P., Shahrzad Mohtadi, Mark A. Cane, Richard Seager, and Yochanan Kushnir. "Climate change in the Fertile Crescent and implications of the recent Syrian drought." *Proceedings of the National Academy of Sciences* 112, no. 11 (2015): 3241-3246

preparedness. The devastating drought in Syria, which some politicians point to as a sign of the causal chain between climate change and the rise of ISIS, could have been prevented by better water conservation policies from the Syrian government.¹⁵ Ultimately what is important with respect to climate change is not the event itself, but the capacity of the affected population to adapt and absorb the induced losses.

Explaining Climate Security

Simply put, climate security is the idea that if climate change has an effect on resources, then it also has an effect on resource security. Similarly, if climate change affects weather, and weather affects military operations, then climate change will also affect military capabilities. The idea of these causality chains is the foundation of all climate security discussions, but there is no specificity to the term, and no structure for establishing a causality chain. This is a perennial challenge with climate security; it is not easy to get governments to commit funds or resources to a security issue where it is impossible to prove that any consequence even occurred as a direct result of climate change. For this reason, the Department of Defense accurately describes climate security as a “threat multiplier,” which is the idea that the threats America already faces will probably occur with greater frequency as a result of climate change.¹⁶ This provides some semblance of an ability to prepare for climate security, despite the murkiness of causal relationships.

¹⁵ Ibid.

¹⁶ Zoe Shlanger, “Pentagon Report: U.S. Military Considers Climate Change a ‘Threat Multiplier’ that could Exacerbate Terrorism,” *Newsweek*, 2014. <http://www.newsweek.com/pentagon-report-us-military-considers-climate-change-immediate-threat-could-277155>

The most obvious realms of climate security concerns are also the ones that are the easiest to deal with. The impact of storms on military bases or infrastructure, or sea level rise affecting ports and ships can be accounted for in budgets or equipment design. Increasingly accessible waters in the Arctic may change the balance of power in a valuable region, but do not present any critical threats to U.S. security. The direct impact of climate change presents some challenges to the U.S. military, but none are insurmountable. The primary challenge in the political sphere for this basic level of climate security has been getting policymakers to acknowledge the issues, and make the necessary budgetary adjustments (a difficult proposition since it detracts from already shrinking discretionary outlays). In this sense, climate security is a policy issue, and its direct effects are relatively easy to adapt to.

Unfortunately, the indirect effects of climate change on security are more difficult to determine, and perhaps present a far greater risk than the direct effect of climate change on security. If climate change does indeed affect the availability of resources like food or water, it could have a much more serious impact on the stability of regions that are already resource insecure.

Food and water security is the most basic form of security. States must have security in food and water before they can achieve true security, because a state cannot survive without these resources. In a modern state, water especially becomes more important for its necessity in industry and energy. Any state that is dependent on another for even this most basic form of security will be vulnerable to influence or conflict. When the value of these resources increases, their value as a target for asymmetric actors also increases. Food and water are also difficult resources to defend while still having an effective infrastructure for distribution. Supplies being poisoned, or even seized, are real threats that unstable regimes would have to protect against—

forcing them to devote an increasingly large share of their military power to defense of those resources rather than combating insurgents.

This is the true threat of climate change: If food and water become scarcer as a result of climate change, then the relative power of insurgent actors to attack or seize those resources rises. In the event that food and water insecurity becomes an increasing problem for states, the security issues are further exacerbated as people may be more likely to join an insurgency if the “legitimate” state is unable to guarantee the security of their food or water. In this sense, climate security is important because areas that are already struggling with insurgencies are less likely to find a resolution, since the relative capability of insurgencies to erode the legitimacy of governments improves with resource scarcity.

While the internal issues of other states are easily dismissed in realist schools of thought, climate security issues may warrant more weight, since the consequences of environmental degradation will likely spill over to neighboring states. Population displacement as a result of a changing environment poses new challenges, since the affected population may never be able to repatriate if the environment does not recover.

It is predicted that some parts of Saudi Arabia will become effectively unfit for human homesteading due to climate change, some major food crops in Sub-Saharan Africa will become extinct, and major cities may completely run out of water.¹⁷ What happens to the populations that live in these affected areas? They do not simply disappear. These persons will become displaced,

¹⁷ Max-Planck-Gesellschaft. "Climate-exodus expected in the Middle East and North Africa: Part of the Middle East and North Africa may become uninhabitable due to climate change." ScienceDaily. www.sciencedaily.com/releases/2016/05/160502131421.htm; Rippke, U. et al. (2016) Timescales of transformational climate change adaptation in Sub-Saharan African agriculture, Nature Climate Change, [doi:10.1038/nclimate2947](https://doi.org/10.1038/nclimate2947) & Travis, W. R. (2016) Mapping future crop geographies, Nature Climate Change.; Evans, Judith. "Yemen could become first nation to run out of water." *The Times* (2009)

relocating to new areas, sometimes as migrants, and sometimes as refugees. However, this will create strain in the receiving areas, as there is increased competition for social services, employment, housing, and resources. Ostensibly, increased migration to a receiving country should be economically beneficial, but from a political standpoint it creates divisions that may divert attention or resources from other policy issues.

We are already witnessing the progress of such a causality chain with the migration to Europe from the Middle East and North Africa. People fleeing both war and poverty in search of a better life in Europe are finding that the social safety nets of the Western societies are unable to absorb such a population growth. For example, in Germany, orphans receive assistance from the government for housing and education, but after 24,000 unaccompanied minors entered Germany in 2014, such programs were unable to offer suitable care for everyone, leaving desperate children to find other ways to cope.¹⁸ A small town in Germany was forced to accept almost ten times as many refugees as the actual population of the town, leading to major questions about the availability of food, transit, water, and emergency services.¹⁹

In receiving states, those who are adversely affected are more likely to turn to extremist ideology as a response, and this also leads to more nationalistic and conservative politics in such a state. This is apparent with the rise of extreme right parties in Poland, anti-refugee parties in France, and also the recent Brexit as many citizens of the United Kingdom have lost confidence in the benefits of their EU membership. As a result of the terrorist attacks in Paris, the zone of free movement within Europe known as the Schengen Area has come under scrutiny, and may be

¹⁸ Erin Banco, "Overwhelmed by Thousands of Refugee Children Traveling Alone, Europe Considers Adoption." *International Business Times*, (October, 2015). <http://www.ibtimes.com/overwhelmed-thousands-refugee-children-traveling-alone-europe-considers-adoption-2125338>

¹⁹ Douglas Ernst. "German Town of 100 Must Take 1,000 Syrian Migrants." *World Net Daily*, (October, 2015). <http://www.wnd.com/2015/10/german-town-of-100-must-take-1000-syrian-migrants/>

suspended or abolished entirely. The EU Commissioner called the Schengen Area a “unique symbol of European integration,” and its loss would undoubtedly have serious repercussions for the economic and political unity within the continent.²⁰

The end result is that climate change leads to conditions that make maintaining unity and cooperation in international politics more difficult to attain. It creates challenges that are more easily remedied through isolation and withdrawal than through cooperation and investment. It creates environments where asymmetric actors have more capability to erode the legitimacy of governments, and it forces populations to relocate to areas that may already be under political strain. Climate change may not present an existential threat to the world and society, but as the Department of Defense aptly describes it as a threat multiplier, it will likely force the U.S. to deal with yet more of the upheaval that Western states are already grappling with.

In a world where the U.S. is currently or was recently engaged in conflicts in Yemen, Syria, Iraq, Afghanistan, Libya, and more, there is a serious question of just how much more strain the U.S. military can handle. Sequestration of military spending has put more pressure on the military to cope with a tightening budget, and climate change could exacerbate problems that the U.S. is already committed to resolving. It is in the U.S.’ strategic interest to identify the most cost-effective and expedient solutions to issues that could affect regional strategic objectives, and future military engagements should better recognize the role that climate change may play in worsening conflicts that the U.S. is already struggling to resolve. If business continues as usual, then the U.S. will increasingly have to either do more with less, or forego some of its engagements.

²⁰ Jean Claude Juncker. “State of the Union 2015: Time for Honesty, Unity, and Solidarity.” *European Commission*, (September, 2015). http://europa.eu/rapid/press-release_SPEECH-15-5614_en.htm

Examples of the Interplay of Environment and Security

It is one thing to talk about the theory of how climate change may create threats to U.S. interests; it is quite another to actually identify them. As stated earlier, it is impossible to identify any single event as having a causal relationship with climate change. This is doubly true for security-related events, which are almost always rooted in political upheaval that is unrelated to environmental factors. Dan Chiu of the Atlantic Council succinctly explains that, “from a purely descriptive and analytic standpoint, I probably wouldn’t call [climate change’s link to terrorism] ‘direct,’ I would call it more environmental and contextual. The effect of climate change can really create conditions that promote terrorism.”²¹ In this vein, the best examples of climate security are the ones where environmental issues have played a significant role in conflicts in ways that they would not have otherwise.

One of the most prevalent examples of a climate security issue is the “mega drought” in Syria, which lasted from 2005-2011. During that time, there were already political issues as Al Qaeda and the Syrian government were in conflict. The instability caused from food and water insecurity further exacerbated existing problems, though it should be noted that if the government had done a better job of preserving food and water resources, it may not have had to cope with climate related problems. Non-governmental workers that were monitoring weakening agricultural yields in Syria claimed that the conflict resulting from the drought “wasn’t really a surprise.”²²

²¹ Tierney Sneed, “Where Security Experts Stand on the Climate Change Causes Terrorism,” *Talking Points Memo*, 2015. <http://talkingpointsmemo.com/dc/terrorism-climate-change>

²² Peter Schwartzstein, “Inside the Syrian Dust Bowl,” *Foreign Policy*, (September, 2016). http://foreignpolicy.com/2016/09/05/inside-the-syrian-dust-bowl-icarda-assad-food-security-war/?utm_source=Sailthru&utm_medium=email&utm_campaign=New%20Campaign&utm_term=Flashpoints

A separate issue though is that the insurgent group that arose from the subsequent conflict, ISIS, has exploited water insecurity in the region to establish legitimacy. The group's control over the Ramadi Dam has allowed it to preserve water for populations under their control, and also to deny water to downstream populations under the Iraqi government's control.²³ They have pursued this strategy across other dams in the region to great effect, and also raised concerns of the dam breaking and flooding downstream areas. ISIS has effectively been able to hold downstream populations hostage thanks to their control of dams—something they would not have been able to do if water was more readily available from alternative sources.

In Somalia, Al Shabaab, a terrorist organization in the southern part of the country, exploited a famine to enrich themselves. Amidst food shortages in 2011, the group—which has allied itself with Al Qaeda—levied taxes on food aid that had been sent as part of a foreign assistance package.²⁴ The group used the taxes to attempt to further legitimize itself in the region, fund violence, and also chastised suppliers of foreign assistance for not purchasing food from Somali vendors, earning them some support from Somalians.

During the Rhodesian Bush War, a drought was to the advantage of insurgent forces. Reduced availability of food made it a more important strategic asset, which insurgents were able to easily steal from poorly guarded farms, causing the government-instituted regulations and installed security measures as part of “Operation Turkey” to little effect.²⁵

One of the worst droughts in Pakistan's history occurred from 1998-2002 after the 1997-98 El Nino. In 2001, political tensions caused by the drought became apparent, as residents of

²³ Sowby, Robert B. "Hydroterrorism: A Threat to Water Resources."

²⁴ Mark Tran, "Al-Shabaab in Somalia exploited aid agencies during 2011 famine," *The Guardian*, 2013. <https://www.theguardian.com/global-development/2013/dec/09/al-shabaab-somalia-exploited-aid-agencies-famine>

²⁵ *Jakkie Cilliers, Counter-Insurgency in Rhodesia*, (London), 1985.

the Sindh province accused the government of diverting more water to the Punjab province. There were at least four bombings throughout the year, and the drought exacerbated ethnic tensions.²⁶

Aside from such events occurring during times of climate-related resource insecurity, there are numerous examples throughout history of insurgents poisoning or attacking food and water resources with varying degrees of effectiveness as an asymmetric warfare tactic. It stands to reason that if climate change makes food or water scarcer in areas where militaries are already operating, then the effectiveness of such tactics by insurgents will be greater as the victims have fewer suitable alternative food or water sources. A study by the Intelligence community found that as water scarcity becomes a greater problem, water infrastructure is more likely to be targeted by insurgents.²⁷ Studies of climate change in insecure areas have also found that environmental factors will likely become a source of refugees.²⁸ In searching for “climate security” issues, the key will be in looking at areas where environmental degradation can cause or exacerbate political instability.

Identifying Climate Insecure Areas

Climate insecurity is a product of two variables: environmental degradation caused by climate change, and the adaptability of the affected society. The concern in climate security is not necessarily the environmental degradation, but if the areas that the U.S. is engaged in are

²⁶ Peter Gleick, “Water and Terrorism,” *Pacific Institute*, 2006. http://www2.pacinst.org/reports/water_terrorism.pdf

²⁷ “Global Water Security,” *Intelligence Community Assessment*, (February, 2012: Washington, D.C.). <http://fas.org/irp/nic/water.pdf>

²⁸ Reuveny, Rafael. "Climate change-induced migration and violent conflict." *Political geography* 26, no. 6 (2007): 656-673

particularly vulnerable. By the very nature of U.S. intervention, it is more likely to occur in poor states that struggle to maintain their own security—which are also less likely to be effective at coping with climate-related issues.

Wealthy, Western states with strong institutions are less likely to suffer political turmoil as a result of climate change. Natural disasters will undoubtedly occur, and the Congressional Budget Office expects that the cost of these disasters will outpace GDP growth, but the costs are expected to be manageable.²⁹ Although climate change will undoubtedly have an economic impact on developed states, it is unlikely that it would be destabilizing to the point that there is a breakdown of political order.

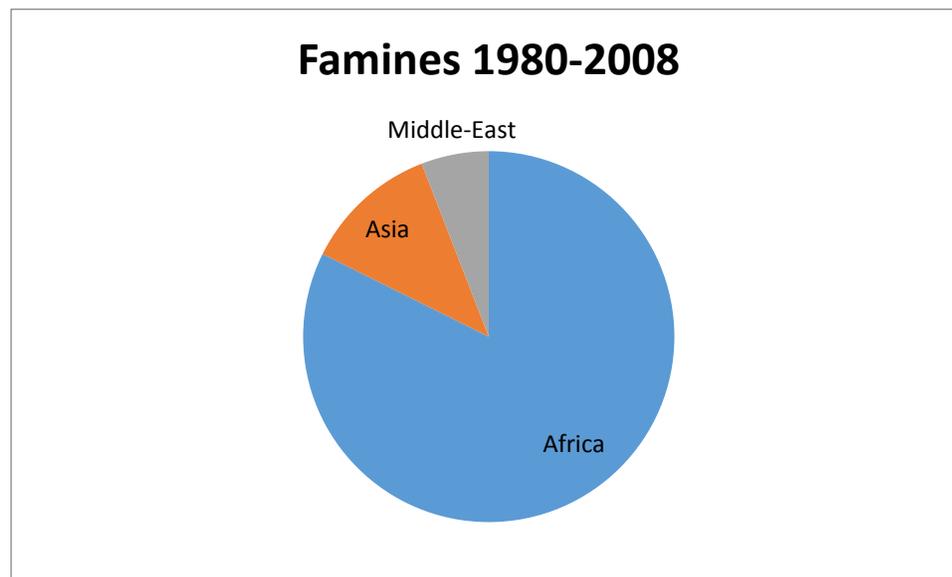
Least developed nations are a different concern. As they (by definition) have weak economies, any policy discipline to conserve natural resources at the expense of economic growth are unlikely to be pursued. If and when resources become scarce, socio-economic divisions will likely be exacerbated, which can lead to conflict. Those who are most adversely affected by resource scarcity are most likely to be drawn into conflict.

In identifying possible locations where poor governmental policies create climate vulnerabilities, it is best to look at regions where environmental conditions have already exacerbated conflicts. Africa in particular highlights the combination of resource scarcity and political conflicts that will likely be the recipe for climate-related security challenges around the world. The key idea is that these conflicts are not the only ones likely to exemplify climate

²⁹ “Potential Increases in Hurricane Damage in the United States: Implications for the Federal Budget,” *Congressional Budget Office*, (June, 2016). <http://www.cbo.gov/sites/default/files/114th-congress-2015-2016/reports/51518-Hurricane-Damage.pdf>

security risks, they should instead be thought of as the first ones occurring in a world that is changing both environmentally and politically.

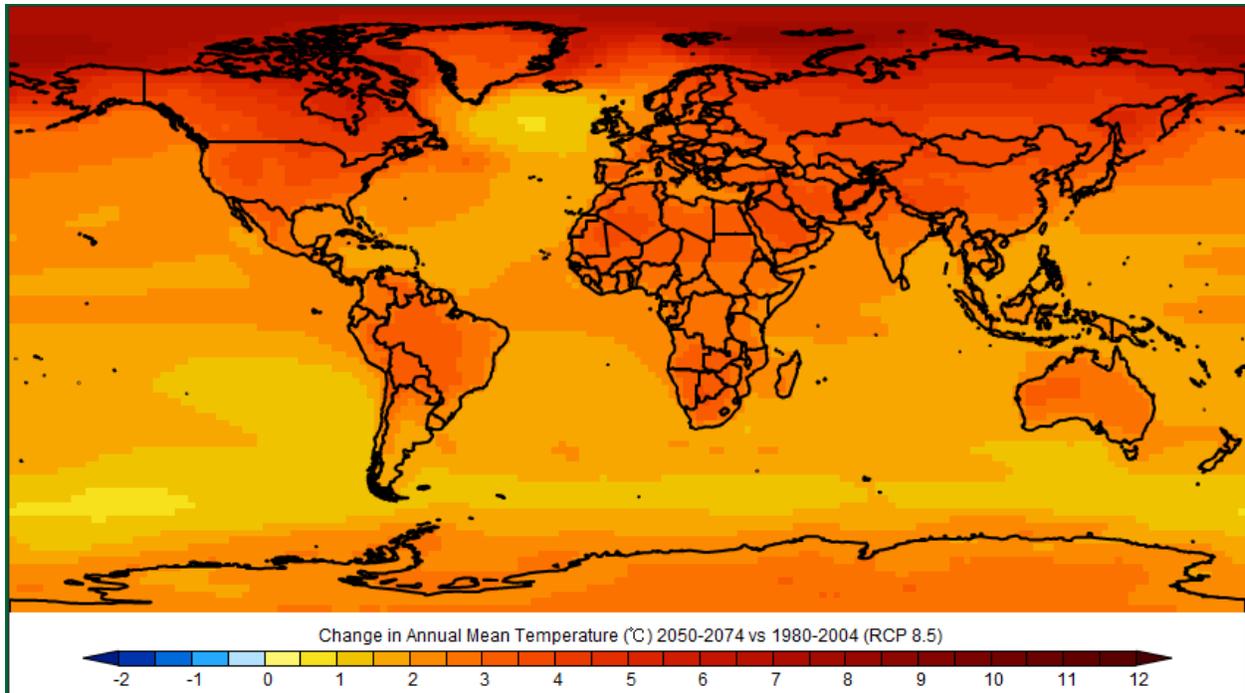
The textbook example of combined human and environmental failures is famine. There is limited information on the occurrence of famines, but data from McGill University shows that 82 percent of famines from 1980-2008 have occurred in Africa.³⁰



1980-2008 famines by location, McGill University

Africa, though, is not especially vulnerable to climate-related resource scarcity. When observing climate models for projected temperature warming, Africa has little difference from other regions.

³⁰ http://www.cs.mcgill.ca/~rwest/link-suggestion/wpcd_2008-09_augmented/wp/1/List_of_famines.htm



*CMIP5 Data Visualization*³¹

Despite this, four states that are vulnerable to both conflict and water shortage are in Africa (Nigeria, Somalia, Ethiopia, and South Sudan).³² Even though events like famine are tied to resource scarcity that is affected by environmental factors, poor governance plays just as large or larger a role in crisis development.

As an example of governmental policies playing a role in resource scarcity, look to water scarcity in Egypt compared to Israel. Egypt relies on the Nile for about 97 percent of its water needs, and given its access to this source does not practice significant water conservation. By contrast, Israel lacks fresh water resources to fulfil its needs, and relies on “unconventional”

³¹ Alder, J.R. and Hostetler, S.W., 2013. CMIP5 Global Climate Change Viewer. US Geological Survey <http://regclim.coas.oregonstate.edu/gccv/index.html> doi:10.5066/F72J68W0

³² Gracie Cook, “Water and Security Hotspots to Watch in 2016,” *Woodrow Wilson International Center for Scholars*, (February, 2016: Washington, D.C.). https://www.newsecuritybeat.org/2016/02/water-security-hotspots-watch-2016-infographic/?utm_content=buffer91fa5&utm_medium=social&utm_source=twitter.com&utm_campaign=buffer

sources (like desalination) for about half its needs. Water conservation is practiced to a much greater extent in Israel. The effect of Israel's policies compared to Egypt's are so apparent, that from outer space Israel's side of its border wall with Egypt is actually greener.

As stated earlier, Syria's poor water conservation policies were a major contributor to civil unrest. There were no efforts to minimize water usage, particularly given that agriculture yields were falling—meaning the government response was to put more pressure on water consumption to increase yields, not consume less water to stretch drought endurance.

A similar event unfolded around Lake Chad in Africa. The Lake Chad River Basin has been steadily losing water, and between 1966 and 2001 has lost 94 percent of its surface area.³³ About half of this was the result of overconsumption from human populations, but the other half is believed to be as a result of climate change.³⁴ A report in 2009 determined that the region was particularly vulnerable to political strife as a result of environmental degradation.³⁵ The cumulative effect of both unsustainable consumption, and the effect of climate change, virtually eliminated a key resource for the region.

Not surprisingly, the loss of Lake Chad in an area prone to conflict exacerbated existing problems. The insurgency, Boko Haram, had its ranks swell as it recruited from the 200,000 displaced persons. Interestingly, Boko Haram fighters that were captured and interviewed possessed little knowledge of the Quran, or the group's religious ideology.³⁶ The conventional wisdom is that, as a result of the loss of Lake Chad, that Boko Haram was able to recruit

³³ United Nations Environment Programme. <http://www.unep.org/dewa/vitalwater/article116.html>

³⁴ Ibid.

³⁵ Nafeez Ahmed, "Behind the rise of Boko Haram," *The Guardian*, 2014. <https://www.theguardian.com/environment/earth-insight/2014/may/09/behind-rise-nigeria-boko-haram-climate-disaster-peak-oil-depletion>

³⁶ Emmanuel Mayah, "Climate change fuels Nigeria terrorism," *Africa Review*, (February, 2009). <http://www.africareview.com/News/Climate-change-fuels-Nigeria-terrorism/-/979180/1334472/-/vq4tja/-/index.html>

otherwise moderate persons into their ranks, despite a lack of overlap in ideology. This phenomenon is concerning, because it puts some merit to the idea that environmental degradation may cause people to join insurgencies more readily.

Although this paper has already explained examples of how climate-related factors can exacerbate existing conflicts, the Boko Haram interconnection with Lake Chad shows how relatively minor security threats can grow rapidly thanks to climate-related factors. Few analysts considered Boko Haram to be a major regional threat, or expected it to align with other extremist groups such as ISIS. In this sense, the biggest concern for a powerful state like the U.S. is that climate related events (either unexpected or progressive over a period of time) will make current or future engagements far riskier if there is any climate vulnerability in the region.

As an example of risk assessment failure, the potential for water scarcity in the Middle East having socio-economic impacts was known since 2001—but was not a factor in consideration for the U.S. invasion of Iraq in 2003.³⁷ While this sole bit of information likely would not have swayed any decision making at the time, ISIS likely would not have been as significant a threat had Iraq not been destabilized. Obviously there is always twenty-twenty hindsight, but for future engagements U.S. strategy should acknowledge that climate related challenges, combined with the potential political instability from engagement, creates greater risks.

³⁷ El-Fadel, Mutasem and Bou-Zeid, Elie R., Climate Change and Water Resources in the Middle East: Vulnerability, Socio-Economic Impacts, and Adaptation (June 2001). FEEM Working Paper No. 46.2001. Available at SSRN: <http://ssrn.com/abstract=278514> or <http://dx.doi.org/10.2139/ssrn.278514>

In attempting to pursue “strategic triage” and preserve U.S. power, the potential risks associated with intervention in climate insecure areas should be given greater consideration. The determination of risk versus reward will be skewed if some risk factors are not considered.

Policy Recommendations

Current action to remediate climate security problems on the part of the U.S. has focused on a three-pronged approach: adapt the military to changing climates, cooperate in global agreements to abate emissions, and provide funding for adaptation measures in less developed climate-vulnerable states. The contentiousness or effectiveness of those approaches will not be addressed here, but a key fact is that climate change is expected to happen despite international efforts with the Paris Agreement, the real question is to what degree. None of these policy approaches actually alter the strategic calculus of the U.S., which is still predicated around a strategy of engagement.

The U.S.’ involvement in Iraq and Syria, which is suffering from extensive mission creep as the American troop presence in Iraq has just been raised to 5,200, highlights the continuation of military intervention as a preferred policy tool.³⁸ The U.S.’ involvement in conflicts is increasing, not decreasing, despite the reduced strategic importance of the Middle East after the oil revolution, as well as the proven climate vulnerability of the region. Given the effect of the conflict on refugee flows, and the ability of ISIS to incite conflicts beyond their “borders,” there may be good rationale for involvement in the conflict. However, should another drought occur—or a climate-related event occurs in another region the U.S. is engaged in—the possibility of

³⁸ Connor O’Brien, “600 more U.S. troops headed to Iraq,” *Politico*, (September, 2016: Washington, D.C.). <http://www.politico.com/story/2016/09/iraq-more-us-troops-deployed-228850>

continued entanglement will rise. Exit planning becomes a much more difficult proposition when inherently unpredictable events threaten to upset whatever modicum of stability is established.

Climate related risks that raise the costs of engagement, and could make establishing stability and exiting conflicts more difficult, should be part of the calculus for determining whether or not engagement is worthwhile in the first place. Unfortunately, the U.S. lacks intelligence assets that are specifically focused on acquiring the necessary information. The CIA's MEDEA program, which was focused on identifying climate vulnerable areas, was shut down due to the contentiousness of government funding for efforts that were not directly focused on countering established threats. Restarting MEDEA, as well as funding other efforts focused on identifying regions that have a combination of political and climate vulnerability, should be a priority for the U.S. government.

In using the information related to climate security, the U.S. should also re-examine its force posture. Realists concede that the U.S. is already in a period of relative decline, and this is driving up the relative costs of engagement in areas of interest. Compounding this challenge, is that there is a reduced political will for a war weary U.S. public. Military engagement is an increasingly costly strategy, is unpopular, and has questionable returns on investment. The U.S., for reasons unrelated to climate change, must be extremely judicious in its decisions of where and when to engage, lest it only accelerate its own decline. In the future, the relative importance of any single engagement will be higher than in the past, when engagements with relatively little importance to maintaining U.S. primacy were pursued regardless (Iraq, Libya, Yemen, etc.). In those engagements, nothing should be left to chance when calculating risk.

Better climate security analysis could enable the U.S. to accurately identify threats to our interests. The effects of climate related security issues, such as in Nigeria and Syria, are obvious

and relatively easy to circumvent after they occur—but preventive measures (such as better water conservation) may need to be taken years beforehand in order to avoid problems. Are regional partners that the U.S. relies on, such as Saudi Arabia, Djibouti, South Korea, Taiwan, etc. adequately insulated from the effects of climate change? Are states that neighbor U.S. allies vulnerable to climate-related challenges that could spill over, or necessitate a diversion of resources? The U.S. itself is relatively isolated from climate related risks, but it relies on a network of allies to project its power—and if those allies are climate vulnerable, it would be another erosion to U.S. relative power.

Given that climate change is a threat multiplier, associated costs of engaging those threats will rise. If the U.S. has the ability to identify those threats beforehand, it can operate best practices in order to minimize the potential for events (such as droughts) that could create threats to interests. This could include advising partner states on water conservation policies, advisement on improvements to infrastructure, advisement on disaster management and evacuation (something the U.S. military has far more training than most other militaries), etc. The relative investment, especially compared to the ongoing conflict in Iraq and Syria, is extremely small. Actually verifying the effectiveness of such policies is nearly impossible since they are targeted towards preventing worst case counterfactuals, but the same is true for other key issues that we invest heavily in, such as nuclear proliferation. If the U.S. wants to avoid strategies with a high degree of risk, it needs to be focused on identifying sources of risk—and that should include climate security threats.

Conclusion

U.S. military and economic strength over rivals is shrinking. The gains and relative costs of military engagement from past years are not representative of the future, where the U.S. should expect to have to do more with less, and get less while investing more. U.S. strategy has relied on a high level of military engagement in order to contain threats. If the costs of those engagements are rising, then U.S. policymakers must be exceptionally judicious in identifying which ones are worthwhile to pursue.

Due to the high level of U.S. engagement abroad, environmental effects that create conditions conducive to terrorism or asymmetrical warfare present a problem. The U.S. itself is relatively insulated from the direct effects of climate change, but as its strategy relies on cooperation from regional partners, such a strategy is likely to be costlier as climate change destabilizes already precarious political systems. In this sense, the Department of Defense is accurate in calling climate change a “threat multiplier.”

A certain level of risk from climate change is inherently unavoidable. However, the U.S. lacks the institutions and tools to accurately identify those threats—particularly in how they overlap with states that are already vulnerable to political upheaval. It would take relatively little funding or effort on the part of the U.S. government to invest in staff and analysis for acquiring such information.

After attaining better information, the U.S. should integrate climate risks into its foreign policy decision making. We are already operating in a time where strategic triage is increasingly important to preserving primacy, but decision making that does not accommodate climate risks could lead to false assumptions as to potential risks. The climate vulnerability of the Middle East

was known well before the U.S.' engagement in Iraq, and although there are numerous unrelated reasons for policy failures with the decision to invade Iraq, future engagement risks should look to the outcome of that engagement and recognize that destabilizing climate vulnerable regions could further raise engagement costs.

Ultimately, the extent to which climate change affects our interests or costs of engagement is currently unknown—but U.S. policymaking process does not acknowledge it in a way that makes sense for strategic decisions. If the U.S. opts to ignore climate related security risks in the future, it should at least do so from a position of confidence as to its insignificance in security issues. It costs very little to expand information on climate's effects on security issues, but has the potential to improve the calculus for engagement decisions that have been increasingly difficult to justify over recent decades.