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14. ABSTRACT

The Department of Defense (DoD) implemented a strategy to decelerate its contributions to climate change within its purview and to mitigate the effects of climate change on its facilities and infrastructure. However, the 2015 National Security Strategy specifically cites climate change as a threat to national security with the caveat climate change could cause conflicts and mass migrations. The current DoD climate change strategy addresses the internal threats to its organization yet does not address the geopolitical climate change threat to national security specifically. This paper recommends a strategic framework to address this gap in the DoD climate change strategy by demonstrating how climate change can serve as an accelerant to conflict in fragile nations, exploring the tools available to assist in modeling the changes in climate, and analyzing the organizational structure within DoD best suited to provide strategic guidance and direction. Sealing the climate change strategy gap serves as a preemptive measure to assist fragile nations absorb the effects of climate change without disrupting the geopolitical climate.

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The Climate Change Strategy Gap: Crafting a Strategic Framework for the Department of Defense

by

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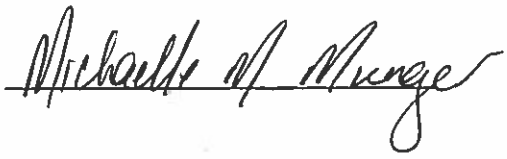
A paper submitted to the Faculty of the Joint Advanced Warfighting School in partial satisfaction of the requirements of a Master of Science Degree in Joint Campaign Planning and Strategy. The contents of this paper reflect my own personal views and are not necessarily endorsed by the Joint Forces Staff College or the Department of Defense.

This paper is entirely my own work except as documented in footnotes. (or appropriate statement per the Academic Integrity Policy)

Signature: 

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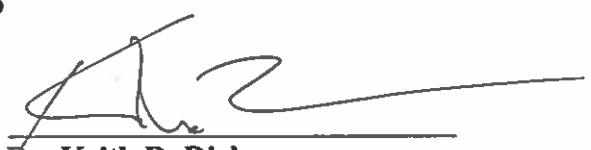
Signature: 

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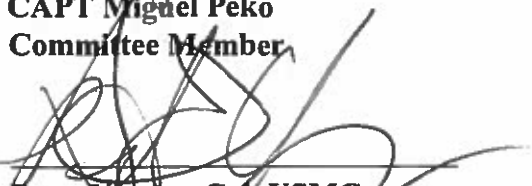
Signature: 

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ABSTRACT

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Introduction

Since the 1970s, industrial activity has been blamed for the changing climate. The debate of what is causing the changes to the global climate still persists; some argue human factors are causing the changes, while others argue earth is simply aging. Empirical data indicates a rising sea level, depletion of the ozone layer, increasingly frequent extreme weather events, and changes in persistent precipitation patterns. Certainly influenced by this data, the President of the United States published two executive orders within the last decade requiring federal agencies to take proactive measures to mitigate their impacts to climate change.[1] Congress also included climate change mitigation measures within the Fiscal Year (FY) 2008 National Defense Authorization Act (NDAA) requiring the Department of Defense to consider the effects of climate change on its facilities and missions, as well as to incorporate climate change activities in the 2010 Quadrennial Defense Review (QDR).[2] DoD finds itself bound by the Executive Orders and the recent Congressional mandates, to take measured steps to mitigate and decelerate climate change within its purview. This paper is not intended to enter into the climate change debate; rather, it is intended to dissect and analyze the climate change strategy DoD has generated to fulfill its executive and congressional

[1] The two orders are Executive Order no. 13514, (*Federal Leadership in Environmental, Energy and Economic Performance), Code of Federal Regulations*, title 3, p. 248 (2009) and Executive Order no. 13653 (*Preparing the United States for the Impacts of Climate Change), Code of Federal Regulations*, title 3, p. 330 (2013).

[2] U.S. Congress, *House Resolution 1585: 2008 Defense Authorization Bill,* 110th Congress, 1st Sess., 2008.

requirements. It also exposes the strategy gap the DoD has in addressing the external threat to national security with respect to climate change and charts a framework for sealing the gap.

The 2015 National Security Strategy (NSS) asserted that climate change is an "urgent and growing threat to our national security."[3] Prior to this declaration, DoD drafted and implemented climate change policy focused on self-centric efforts. While the new strategy will certainly drive new policy, the current efforts are restricted to reducing greenhouse gas emission, pursuing energy efficient technologies, assessing infrastructure vulnerable to rising sea levels, and identifying the challenges related to the Arctic snow melt. Although DoD relates climate change as accelerants to conflict and threat multipliers, the Department has yet to address how to plan for, or mitigate, these conditions leading to global crises that potentially could affect national security.

Christine Youngblut authored a report for The Institute for Defense Analyses highlighting the international and national security challenges attributed to climate change, which mirrored the President's concerns that climate change presents a threat to national security. These challenges were described as resource scarcity, political and economic stresses on fragile states, and refugee migrations.[4] The international community has already felt the effects of climate change as relationships between states have altered as they deal with the manifestations of these challenges. Using modeling tools and scenario-driven exercises, strategists can help identify how states vulnerable to climate change could be affected in both the near term and distant future. These studies,

[3] Barrack Obama, *National Security Strategy* (Washington, DC: The White House, February 2015), 12.
[4] Christine Youngblut, *Climate Change Effects: Issues for International and US National Security* (Alexandria, VA: The Institute for Defense Analyses, 2009), 3.

in turn, may assist DoD and other agencies to develop strategies to reduce potential climate change threats to U.S. security.

DoD has an opportunity to ward off the threat of climate change to the geopolitical environment while minimizing its long-term effects. Currently, DoD's strategy for climate change is a simple framework to reduce the influence of climate change to its infrastructure as well as decelerate DoD's contributions to greenhouse gas emissions. However, DoD completely neglects the geopolitical threats that may exist as a result of climate change. This failure to consider the geo-strategic ramifications of climate change to U.S. security interests is what this thesis describes as the climate change strategy gap. To build a strategy addressing potential threats to geopolitical stability as a result of climate change, it is important to understand the strategic environment from the perspective of climate change, know what tools are available to help frame the strategic environment, look at case studies for historical context that demonstrate how climate change can accelerate instability in fragile nations, and determine how the strategy should be synchronized. This paper charts the path to a strategic framework for the DoD to seal the climate change strategy gap.

Current Department of Defense Climate Change Policy

The first codified requirement for DoD to act and address climate change came from the Fiscal Year (FY) 2008 National Defense Authorization Act (NDAA) passed by Congress. The act required DoD to prepare a Quadrennial Defense Review (QDR) subsequent to the approval of the act, which was to include climate change guidance to military planners in order to assess risks, update defense plans based on these risks, and

develop capabilities to reduce future impacts.[5] The second codified order requiring DoD to reduce the effects of climate change came from Executive Order 13514, which established goals for each of the executive agencies to achieve in decelerating greenhouse gas emissions.[6] Coupled with the 2008 NDAA and the Executive Order 13514, these two requirements set the DoD in motion to begin to define a strategy to address its climate change requirements. The DoD responded to the Executive and Congressional requirements by establishing a framework and structure to initiate climate change action.

Prior to the release of the 2008 NDAA and the Executive Orders, the Office of the Deputy Under Secretary of Defense (Installations and Environment) and the Office of the Under Secretary of Defense (Policy) with support from the combatant commanders, proactively instituted the Defense Environmental International Cooperation (DEIC) program. This program, highlighted in the 2014 Roadmap to be introduced later in the paper, served to advance the DoD's security cooperation guidance providing security activities for engagement with the international community. The guidance addresses the standard security cooperation activities such as: countering the proliferation of weapons of mass destruction; partnering to maintain access to resources for training and readiness; contributing to interoperability; promoting regional cooperation; and improving interagency processes, focus, and integration.[7] However, the guidance added two additional areas that are worth mentioning separately: "sharing environmental information and fostering a global environmental ethic."[8] These two areas highlight

[5] U.S. Congress, *House Resolution 1585: 2008 Defense Authorization Bill*, 110th Congress, 1st Sess., 2008.
[6] Barrack Obama, Executive Order no. 13514, *(Federal Leadership in Environmental, Energy and Economic Performance), Code of Federal Regulations*, title 3, p. 248 (2009), 248.
[7] U.S. Department of Defense, *Fiscal Year 2004 Defense Environmental Programs Annual Report to Congress* (Washington, DC: U.S. Department of Defense, 2004), Q-1.
[8] Ibid.

efforts DoD can bring to the international community regarding the environment and climate change. The intent is to allow DoD to share environmental information abroad, the techniques the U.S. practices at home. These include, water treatment procedures, landfill technologies, and storm water runoff treatment, which are technologies DoD can share with foreign states unfamiliar with these concepts.

To foster a global environmental ethic, the DoD has a robust environmental program to ensure compliance with laws and regulations both within the United States and abroad. Sharing how DoD maintains compliance and seeks to continue to be a good steward to the environment sets an example to the global community that even the wolrd's most powerful military is concerned about the environment.

The Secretary of Defense responded to the NDAA by publishing the 2010 Quadrennial Defense Review (QDR), which asserted that climate change was a threat to national security. Even though the QDR was careful not to quantify the threat, the QDR did outline the requirement for DoD to begin crafting a strategy to address climate change on two broad fronts: address climate change and its influence on the operational environment on DoD's missions; and examine how climate change affects DoD facilities and capabilities. The QDR indicated that operations would be influenced by physical changes in the environment, such as persistent precipitation or drought, rising sea levels, snowmelt, and extreme weather events. It also stated that the intelligence community indicated these effects to the operating environment could accelerate instability in fragile nations, serve to exacerbate conflict, increase DoD's role in responding to natural disasters, and bring new threats in the Arctic.[9] In addition, rising sea levels would

[9] Robert M. Gates, *Quadrennial Defense Review* (Washington, DC: U.S. Department of Defense, February 2010), 84-88.

endanger numerous DoD facilities on the coastlines. To address these two broad concerns, the 2010 QDR indicated the Department would invest in assessing risks to adapt and mitigate the effects, invest additional resources in the DEIC Program, and look for energy technologies to decelerate the Department's contribution to climate change.[10]

The Secretary of Defense also responded to legislation by establishing the role of the DoD Senior Sustainability Officer (SSO). The SSO and his staff is charged with drafting the strategy to address the broad concerns and monitoring the department activities to ensure compliance with the Executive Orders and the congressional requirements. The (SSO) reports to the Under Secretary of Defense for Acquisition, Technology and Logistics and oversees the DoD Senior Sustainability Council (SSC). The role of the SSC is as follows:

> The SSC is charged with developing strategy, recommending policy, and ensuring coordination on sustainability initiatives across the Department . . . . The SSC directs, oversees, and supports development of the Department's annual integrated Strategic Sustainability Performance Plan and has purview over mitigation through greenhouse gas emissions reduction efforts and climate change adaptation.[11]

Subsequently, in 2012, the SSC established a Climate Change Adaptation Working Group (CCAWG). This working group is comprised of representatives from each of the Armed Services, the Joint Staff, and the Secretary of Defense's (OSD) offices of Policy, Operational Energy Plans and Programs, and Personnel and Readiness. Both the SSC and the CCAWG are to analyze and draft DoD's climate change policies and practices, coordinate with external stakeholders (including Department of Energy and the

[10] Gates, *Quadrennial Defense Review*, 84-88. The DEIC program promotes cooperation on environmental security and augments international adaptation efforts.
[11] U.S. Department of Defense, *Fiscal Year 2014 Climate Change Adaptation Roadmap* (Washington, DC: U.S. Government Printing Office, 2014), 3.

Environmental Protection Agency, to name a few), and to ensure DoD has access to climate change information to make informed decisions.[12] Collectively, this group drafted DoD's Fiscal Year (FY) 2014 Climate Change Adaptation Roadmap (CCAR) to provide guidance to the services on how to evaluate climate change risks and vulnerabilities as required by the Executive Order. The CCAR is the strategic document that supports the majority of DoD efforts on climate change that are reportable to the President's Council on Environmental Quality and the Office of Management and Budget.[13]

The CCAR has three goals: the first is to identify and assess the effects of climate change on the Department, the second is to integrate climate change considerations across the Department and manage associated risks, and the third is to collaborate with internal and external stakeholders on climate change challenges." [14] Stakeholders include offices within the DoD affected by climate change, as well as other Executive agencies such as Department of Energy, the Environmental Protection Agency, and the Department of State, to name a few. Four lines of effort support the goals, which include plans and operations, training and testing, built and natural infrastructure, and acquisition and supply chain. As written the goals and lines of effort narrowly focus on DoD-centric efforts; this is where the strategy gap begins to unfold. Neither of the goals or lines of efforts addresses assessing the effects of climate change on the geopolitical climate.

The CCAR begins with an assertion that "climate change will affect the DoD's ability to defend the Nation and poses immediate risks to U.S. national security."[15] The risks

[12] Ibid.
[13] U.S. Department of Defense, *Fiscal Year 2014 Climate Change Adaptation Roadmap,* 3.
[14] Ibid., 1.
[15] Ibid.

are explained as intensifiers for global instability, which will "likely lead to food and water shortages, pandemic diseases, disputes over refugees and resources, and destruction by natural disasters in regions across the globe."[16] To address these risks, the CCAR set forth actions based on two types of responses: adaptation and mitigation. Mitigation responses are primarily focused on the efforts to decelerate climate change by reducing the DoD's greenhouse gas emissions. Adaptation responses, which refer to planning for expected changes to occur, are primarily focused on reducing the effects of climate change on DoD infrastructure, facilities, and missions. As a strategic roadmap, adaptation responses will garner the most direct results for addressing the climate change risks to national security once DoD identifies those responses. However, the adaptation measures DoD is currently implementing seeks only to mitigate climate change effects within the DoD purview, not globally.

Dissecting the DoD Climate Change Adaptation Roadmap

The CCAR identifies four climate change phenomena that represent risks, both immediate and otherwise, to U.S. national security interests: sea level rise and associated storm surges, rising temperatures, increasing frequency or intensity of extreme weather events, and changing precipitation patterns.[17] Dissecting these four phenomena and their influence provides a framework for understanding current DoD efforts by identifying the organizations responsible within DoD for mitigating the effects. More importantly, this examination will expose what actions DoD is not taking to address broader climate change risks.

[16] U.S. Department of Defense, *Fiscal Year 2014 Climate Change Adaptation Roadmap*, 1.
[17] Ibid., 4.

The first identified climate change risk to DoD is the threat of rising sea levels. Rising sea levels are gaining the attention of countries with long coastal lines, as well as vulnerable island nations. According to the United Nations Intergovernmental Panel on Climate Change (IPCC), sea levels have risen 3.2 millimeters per year from 1993 to 2010 and are projected to continue to rise due to ocean thermal expansion and glacier melts. The threat of rising sea levels include permanent land submergence, flooding, erosion, and salt water intrusion. The potential damages include loss of infrastructure, decreased coastal land availability, erosion, disruption of fresh water supplies, rising water tables, and loss of ecosystems.[18]

DoD currently has 30 continental U.S. military installations that are at or near sea level, rendering them vulnerable to rising sea levels.[19] The Services are responsible to conduct vulnerability assessments to their installations independently, as facility and installation management is a Service responsibility. Each Service has an engineering organization equipped to conduct the climate change vulnerability assessments at their installations and individual installation planners are responsible for including adaptation measures in their master plans for future development projects to mitigate sea level rise.[20]

The second identified climate change risk to DoD is the threat of rising temperatures, which fuels the greenhouse gas debate. Scientists attribute the rising temperatures around the globe to greenhouse gases from industry. They assert that these greenhouse gases have raised the earth's average temperature 1.4 degrees since 1970. Six of the warmest

[18] United Nations Intergovernmental Panel on Climate Change Working Group II, *Climate Change 2014: Impacts, Adaptation, and Vulnerability* (New York: Cambridge University Press, 2014), 368.
[19] Catherine Foley, *Military Basing and Climate Change* (Washington, DC: American Security Project November, 2012), 1.
[20] Adaptation measures can include building structures above the 500-year flood plain, placing bilge systems in basements, and raising the grade level of airfields, to name a few.

years on record have occurred within the last eight years. The effects of rising temperatures include increasing seasonal temperatures, diminishing crop yields, melting snow and ice reservoirs in the mountains that feed river systems, increasing droughts, wild fires, and weather systems producing more destructive storms.[21]

Rising temperatures also have a graduated effect on DoD, and installation managers have felt their effects. Dust suppression measures in arid locations have increased, energy and water consumption bills have increased, and fire-hazard days at training ranges have become more common. Service installation managers have responded to mitigate these problems by building or incorporating energy efficient systems in the infrastructure and searching for net-zero energy and water technologies.

One of the most visible effects of the rising temperatures is the Arctic melt. The United States is considered one of the Arctic nations that include Canada, Denmark, Finland, Iceland, Norway, Sweden, and Russia. As the ice melts, the Arctic Ocean will become more navigable; while creating trade advantages, this poses new security challenges as well. The strategic importance of this ice melt is the accessibility and navigability of the Bering Strait. The ice-free strait will open trade routes between Europe, Russia, and Asia, as well as provide open water access for naval forces. The economic importance of the Arctic is its vast untapped oil and gas resources, estimated at approximately 22 percent of the world's hydrocarbons. Conflicting claims to mineral resources and territorial sovereignty in the Arctic have the potential for conflict.[22]

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[21] Lester Brown, *Plan B 2.0: Rescuing a Planet Under Stress and a Civilization in Trouble* (New York: W.W. Norton & Company, 2006), 61.
[22] U.S. Department of Defense, *Department of Defense Arctic Strategy* (Washington, DC: U.S. Department of Defense, November 2013), 3.

In 2013, the President published the *National Strategy for the Arctic Region*, to further expound on the *National Security Strategy's* objective of a "secure and stable region where the U.S. national interests are safeguarded, the U.S. homeland is protected, and nations work cooperatively to address challenges."[23] DoD followed with the *Department of Defense Arctic Strategy* in support of these ends and has outlined its approach through ways and means by designating the Commander, United States Northern Command (USNORTHCOM) as the Arctic lead to collaborate DoD's efforts in support of the Arctic strategy.

The third identified climate change risk to DoD is the threat of extreme weather events. Extreme weather events exacerbated by the phenomena of climate change is anticipated to increase in frequency and also in intensity, affecting the entire globe. Changing precipitation patterns with less frequent light and moderate rain patterns are being replaced by more heavy rain events; likewise dry temperature patterns are emerging. Last year alone, the world witnessed several devastating extreme weather events to include a five-day July rainfall in New Zealand, rare frost occurrences in Australia, a Himalayan snowstorm, flooding in Jakarta, a high west Pacific tropical cyclone, extreme heat events in Korea and China, a drought in East Africa, an Argentinean heat wave, California wildfires, and a massive snowstorm in New England.[24]

Other notable events within the past decade include the Cyclone Nargis in Burma; the monsoon floods in Pakistan; Hurricanes Ike, Katrina and Sandy; flashfloods in China, North Korea, Brazil, Argentina, India, El Salvador and Russia; the wildfires including

[23] Ibid., 4.
[24] Stephanie Herring, Martin Hoerling, James Kossin, Thomas Peterson and Peter Stott, "Explaining Extreme Events of 2014 from a Climate Perspective," *Bulletin of American Meteorological Society* 96, no. 12 (December 2015): 5-136.

Black Forest Fire, Yarnell Hill Fire, and Witch Fire; and the deadly heat wave in Europe. Each of these extreme weather events costs billions of dollars in infrastructure damages, loss of lives and property, and massive government response.

The final identified climate change risk to DoD is the changing precipitation patterns. The many issues the U.S. could face from changing precipitation patterns include droughts or water inundation on the homeland, which while not in the purview of the DoD to solve, these conditions will affect and threaten DoD infrastructure. For example, Vandenberg Air Force Base in California is located in an area suffering from long-term drought. The installation must mitigate the effects of the drought by limiting water use and employing efficient water use practices. In an extreme case, the base could be closed or moved at the behest of the Service. Another example where DoD infrastructure was threatened from an extreme weather event occurred in 2005 when Hurricane Katrina destroyed more than 95 percent of Keesler Air Force Base in Mississippi.[25]

The threat of changing precipitation patterns has the potential to influence global fresh water availability as climate change makes wet areas wetter and dry areas dryer.[26] Rain-fed agricultural systems reliant on water in the mid-latitudes and semi-arid low latitudes of the globe will be threatened with near permanent drought, degrading agriculture economies as well as energy production. Tropical areas are expected to experience water inundation, which will change growing season patterns. The disruption of precipitation patterns in many areas of the world has the potential to lead to a multitude of crises. The threat outside the U.S. has the potential to contribute to instability in fragile states, which

[25] Catherine Foley, *Military Basing and Climate Change* (Washington, DC: American Security Project, November, 2012), 2.
[26] United Nations Intergovernmental Panel on Climate Change, *Fourth Assessment Report: Climate Change 2007 Synthesis Report* (New York: Cambridge University Press, 2007), 2.

can have a significant influence on U.S. security interests. The challenge with changing precipitation patterns is identifying when and how the patterns will emerge. Most modeling indicates the changes can be as near as five years, but may not occur for another ten, fifteen, twenty, or even thirty years. This is a significant potential problem that is very difficult to plan for given the uncertain nature and shifting of climate patterns.

Each of the identified climate change risks to DoD is countered with self-centric mitigation measures. The ramifications for DoD and U.S. national security are not yet clearly defined. The CCAR is silent about the essential strategic question: define the threats to U.S. national security that are exacerbated or created by changing climate patterns in the geopolitical realm. This is the climate change strategy gap that currently exists. While meeting the intent of Congress and the Commander-in-Chief with regard to addressing climate change, the CCAR is not a strategy; rather, it is a broad plan of action. A self-described roadmap, the CCAR lacks the structure necessary for true strategy development. To formulate a strategy, a framework and formulation methodology is needed.

Identifying the DoD Climate Change Strategy Gap

The 2015 National Security Strategy (NSS) highlights "climate change is an urgent and growing threat to our national security, contributing to increased natural disasters, refugee flows, and conflicts over basic resources like food and water."[27] Although the NSS does not explicitly express this threat exists external to the U.S. it is implied as the next paragraph suggests "America is leading efforts at home and with the international

[27] Barrack Obama, *National Security Strategy* (Washington, DC: The White House, February 2015), 12.

community to confront this challenge." [28] In concert with the NSS, the DoD CCAR states:

> Among the future trends that will impact our national security is climate change. Rising global temperatures, changing precipitation patterns, climbing sea levels, and more extreme weather events will intensify the challenges of global instability, hunger, poverty, and conflict. They will likely lead to food and water shortages, pandemic disease, disputes over refugees and resources, and destruction by natural disasters in regions across the globe.[29]

Both documents speak to climate change as a threat to national security and a potential cause for instability and conflict. Climate change is identified as the problem, but neither document goes beyond this except for a generic pledge of support to the "Green Climate Fund to help vulnerable developing nations deal with climate change, reduce carbon pollution, and invest in clean energy."[30] The CCAR indicates DoD must assess how the effects of climate change may "interact with other stressors – poverty, environmental degradations, political instability and social tensions – to accelerate conflict and instability detrimental to U.S. interests."[31] This assessment could represent a start to begin formulating a strategy, yet has not been accomplished. However, as both documents identify a potential cause and effect relationship between climate change with future instability, and by extension, threats to U.S. strategic interests, there is no attempt to formulate a strategy to mitigate those global threats that climate change poses to the international community. This is the climate change strategy gap.

The Importance of Strategy

Harry Yarger defines strategy as the "calculation of objectives, concepts, and resources within acceptable bounds of risk to create more favorable outcomes than might

[28] Obama, *National Security Strategy*, 12.
[29] U.S. Department of Defense, *Fiscal Year 2014 Climate Change Adaptation Roadmap*, 1.
[30] Obama, *National Security Strategy*, 12.
[31] U.S. Department of Defense, *Fiscal Year 2014 Climate Change Adaptation Roadmap*, 1.

otherwise exist by chance or at the hands of others."[32] In other words, a situation cannot be made more favorable without a calculated effort. He clarifies further objectives, concepts and resources as equivalents to ends, ways, and means. In essence, strategy balances ends, ways, and means with acceptable risk. Mitigating climate change threats will similarly require a strategy to "create a more favorable outcome" commensurate with the NSS seeking to mitigate the threat climate change poses to national security.

Climate Change as an Instability Accelerant

To craft an effective climate change strategy, it is necessary to examine how climate change influences the strategic environment. Strategists must understand how stressors within a particular country can be exacerbated by climate change related activities such as drought, flooding, and inundation. Once understood, a strategist can point to trends that have a high probability of creating unrest, state collapse, or mass migrations. By recognizing these trends, strategists can develop long-term theater strategies and Theater Campaign Plans (TCP) for Phase 0 operations that provide assistance to forestall or prevent a crisis that might threaten U.S. national interests.

More than thirty years ago, Thomas Homer-Dixon sought to understand how environmental stressors could influence the geopolitical environment. He developed a rudimentary diagram as a basis to depict the different variables that contribute to instability in any given nation, which can still be used today. The result of his research is depicted in the Environmental Change and Acute Conflict Diagram (see Figure 1) and is meant to serve as starting point where pertinent variables can be added to reflect the

[32] Harry Yarger, *Strategic Theory for the 21st Century: The Little Book on Big Strategy* (Carlisle, PA: Army War College Strategic Studies Institute, 2006), 1.

circumstances of a state at a given time. This provides a methodology for considering the level of influence the effects of climate change may have on a nation in relation to other variables, such as the size of the population, their productivity, the stability of the government, cultural impacts, and environmental considerations, including whether or not the nation relies on agrarian sustenance, is mountainous, or lacks natural resources, etc.

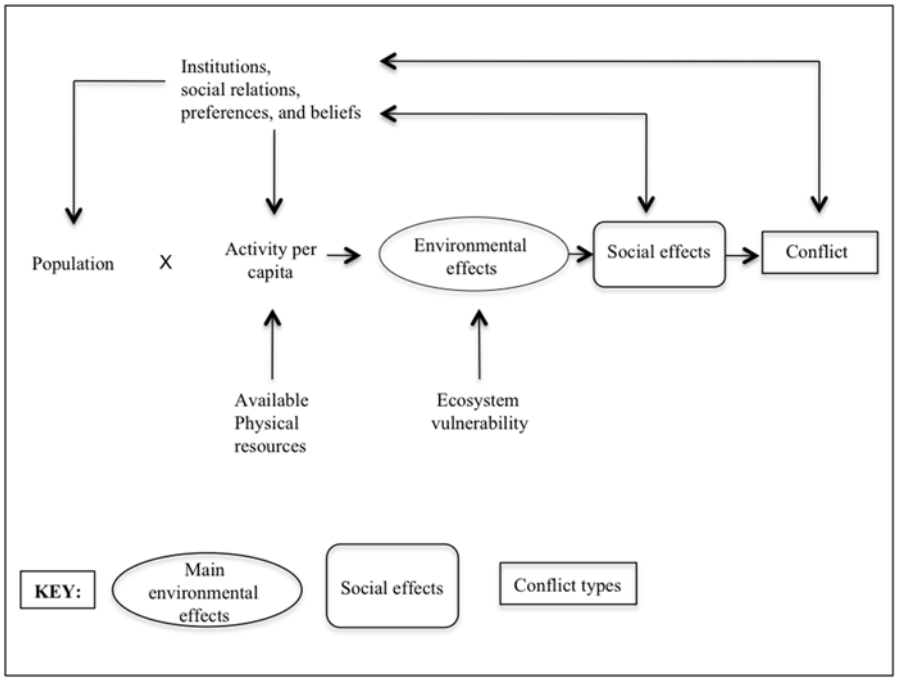

Figure 1. Source: Thomas Homer-Dixon, "On the Threshold: Environmental Changes as Causes of Acute Conflict", *International Security* 16, no 2. (Fall 1991): 77.

The multifaceted violence in Syria, a combination of civil war, eroding violence, great power proxy war, and terrorist subversion is currently one of the most troubling national security issues for the U.S. and Europe. The problem seems intractable, yet using Homer-Dixon's model, it is possible to trace how environmental conditions, as a result of climate change related events, led to the current situation. Syria will be presented as a case study for understanding the potential strategic ramifications of climate change and

for demonstrating the requirement to develop a strategic approach to prepare for potential climate change related threats to national security.

Syria: A Case Study

Syria provides an example of how climate change, serving as an instability accelerant, can push a fragile nation into further instability. Syria's collapse began in 2011 as a result of a number of complex factors, one of which was water scarcity due to a severe drought caused by a change in the precipitation pattern. Syria occupies one of the driest areas in the world and has been battling water scarcity for more than a quarter century.[33] This condition undoubtedly shaped a number of other factors that led to violence: the war in Iraq, an unpopular regime, a society rich with ethnic and religious tensions, and a population growth from 2 million people in 1900 to more than 24 million in 2012.[34]

Syria has four freshwater rivers flowing through the country, none of them originating in Syria, and each of the rivers are under dispute with border nations. The tensions derive from dams in other countries limiting water flow into Syria. The United Nations Economic and Social Commission for West Asia (UNESCWA) published a report, which indicated the water flow in the Euphrates from Turkey to Syria has seen a stark decline from 30 billion cubic meters (BCM) prior to 1973 to 22.8 BCM after 1990.[35] This decline is due primarily to Turkey constructing the Ataturk Dam. Tensions

[33] Syria is extremely vulnerable to water scarcity based on its location. According to the UN Environment Program (UNEP) Syria is considered a water scarce nation, with an average rainfall less than 250mm a year. This is reported from the World Bank Online, "Climate Portal," http://sdwebx.world.bank.org/climate portal/ index.cfm?page=country_historical_climate&ThisRegion=Middle%20East&ThisCCode=SYR (accessed November 17, 2015)

[34] Statistical Abstract/Central Bureau of Statistics, "Syrian Arab Republic," http://www.populstat.info/Asia/ /syriac.htm (accessed November 17, 2015).

[35] United Nations Economic and Social Commission for Western Asia, *Inventory of Shared Water Resources in Western Asia* (New York: United Nations, 2013), 58.

also exist between Syria and Jordan over the Syrian dam on the Yarmouk River, and there is a long-standing dispute with Iraq regarding the Tigris River. Limited water flow into Syria over the last decade coupled with the drought became a significant challenge for the Assad regime.

This most recent drought, which started in 2006, was the first to last more than two seasons, and has reached a record five-years drought with enormous ramifications.[36] Syria's increased population has made a significant demand on water resources, as well. Out of the 14 governorates in Syria, nine rely on agriculture as their mainstay and income. The agriculture industry provided economic support to Syria and also kept a rural population self-reliant.[37] According to the United Nations Food and Agriculture Organization (FAO) approximately 25 percent of Syria's gross domestic product (GDP) relies on agriculture, 90 percent of Syria's water is used for agriculture which serves as a way of life for more than 46 percent of the population (approximately 11 million people) living in the rural areas. Approximately 62 percent of the rural population lived in poverty with only 14 percent of the labor force in agriculture.[38] It is important to discern that the majority of the rural population relied on water for their sustenance and way of life. Much of the developed nations have access to water, even in drought conditions due to plentiful reservoirs and developed irrigation systems, which were lacking in Syria.

Prior to the drought, in 2005 and into 2006, the Bashar Assad regime detected rumblings of a revolution pinned on seeking democracy. Without sufficient water to

[36] Peter Gleick, *Water, Drought, Climate Change and Conflict in Syria* (Oakland, CA: Pacific Institute, February 2014), 332.
[37] Ibid., 7-8.
[38] Food and Agriculture Organization of the United Nations, *Syrian Arab Republic, Joint Rapid Food Security Needs Assessment*, (New York: United Nations, 2012), 7.

irrigate crops and sustain livestock, people in the rural areas led the Syrian government to seek assistance from the UN and pressured the Assad regime for reform. Buckling to the pressure, the government of Syria requested a team from the United Nations to conduct an assessment of food scarcity conditions in the rural areas caused by the drought. It was already too late; the team could only access a handful of locations due to deteriorating security conditions.

The UN team's report was shocking: close to 70 percent of rain-fed crop areas had been abandoned; the rural population was moving to urban areas; local markets closed; migrant labor dependent on agriculture were without work as lack of water reduced irrigation capacity; and government rationing policies only increased tensions among farmers. The number of livestock diminished due to lack of grain and water; populations burned shrubs for energy leading to desertification; inland fisheries were diminished; and malnutrition was commonplace.[39]

Not surprisingly, Syrian cities became the focal point of protests against the Syrian government. As farmers moved to the city and the drought continued, unemployment had reached 25 percent by 2008.[40] The demonstrations were not only due to people wanting regime change, but they were also protesting the Syrian government's poor water management decisions and subsidy policies. The drought had ruined the country's economy and the government exacerbated the problem by failing to support its people.[41]

[39] United Nations, *Syrian Arab Republic, Joint Rapid Food Security Needs Assessment*, 9-15.
[40] Suzanee Saleeby, "Sowing the Seeds of Dissent: Economic Grievances and the Syrian Social Contract's Unraveling," Jadalaiyya, entry posted February 16, 2012, http://www.jadaliyya.com/pages/index/4383/ (accessed November 28, 2015).
[41] Ibid.

While drought alone did not cause the unrest in Syria, Homer-Dixon outlines several potential scenarios where environmental changes can "shift the balance of power between nation states either regionally or globally producing instabilities that could lead to war."[42] These scenarios include refugee migrations that destabilize the countries receiving the migrations due to social or cultural stressors, internal civil unrest due to internal competition for dwindling water supplies, poor nations taking military action against better-off nations to capture resources, and nations potentially using food access as a weapon in a limited agriculture environment.[43] As Homer-Dixon's model illustrates, environmental factors interacted in such a way to accelerate conflict in the absence of an adequate government response seen in Syria.

Homer-Dixon describes three types of conflict that can arise from severe environmental degradation. These three types include simple scarcity conflicts, group-identity conflicts, and relative-deprivation conflicts.[44] In the case of the Syrian diagram below, the conflict manifested from the variables driving the state into his described relative-deprivation conflict and group-identity conflict. Relative-deprivation occurs when the population in developing societies feels discontented when the gap between their actual levels of economic achievement is less than what they feel they deserve with the rate of change being the key factor. The conditions in Syria also provided safe-havens for violent extremist groups, causing a clash between identities. Figure 2 below illustrates the relative-deprivation and group-identity conflict theory as it applies to

[42] Thomas Homer-Dixon, "On the Threshold: Environmental Changes as Causes of Acute Conflict," *International Security* 16, no 2. (Fall 1991): 77.
[43] Ibid., 78.
[44] Ibid., 104-111.

Syria.[45] Because the farming population grew frustrated with the social structure, it provided an opportunity for the disenchanted to challenge the existing authority, an ingredient for Homer-Dixon's theory.[46]

As fragile nations are influenced by conflict accelerants like drought or rising seas, other threats may self-manifest. Depopulation and lack of government control continue to offer safe havens for non-state actors or internal hostile actors. As the conflict in Syria continued to metastasize, the rise of the Islamic State of Iraq and the Levant (ISIL) and other state and non-state sponsored hostile actors have drawn the U.S., Russia, and France into the conflict.

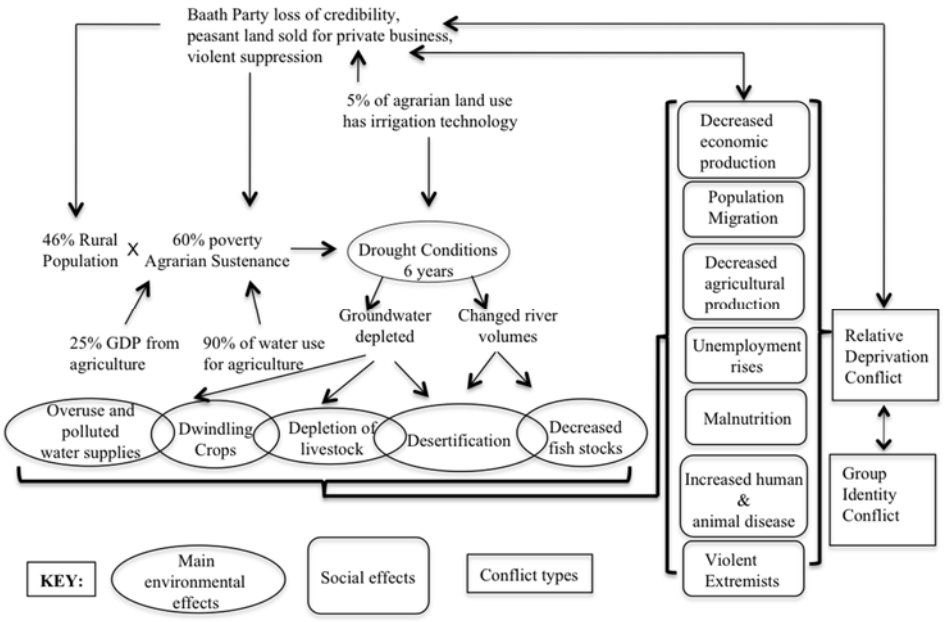

Figure 2. Homer-Dixon Environmental Change and Acute Conflict Diagram as it relates to Syria Data provided by the author.

[45] Using Homer-Dixon's Environmental Change and Acute Conflict diagram, the author drafted a diagram to illustrate how the variables interacted to provide an overall assessment of Syria.
[46] Homer-Dixon, *International Security*, 109-110.

As of October 31, 2015, the total cost of U.S. operations in and around Syria reached $5 billion, and represents more than double the $1.8 billion the United Nations projected the Syrian economy lost due to the drought from 2006 to 2012.[47] The cost of supporting the Syrian government in advance with a united international effort to alleviate the social and economic catastrophe caused by the drought could have possibly stabilized the situation, and bought time to address long-term stability. Now the EU and the U.S. are not only dealing with the ramifications of a military conflict in Syria, they are now dealing with the problem of mass refugee migration into Europe and North America.

Developing a Climate Change Strategy Framework

Having the strategic foresight to recognize the environmental conditions in Syria as a potential instability accelerant and a threat to U.S. interests in the Middle East, the U.S. could have proactively fostered a strategic response. Leveraging U.S. Central Command (USCENTCOM) along with the Department of State, Department of Agriculture, the United Nations, and even the European Union, the DoD could have spearheaded an effort that offered the Syrian government assistance in return for reform and modernization using the diplomatic, economic, and information elements of power in a Phase 0 Theater Campaign Plan that would have furthered U.S. interests by promoting peace and stability in a fragile country.

The Syria case study demonstrates how the climate change influencing precipitation patterns can accelerate instability. In order to mitigate threats to national security similar to the Syria situation, a strategic framework must be established to examine the role of

[47] U.S. Department of Defense, Operation Inherent Resolve Website, http://www.defense.gov/News/Special-Reports/0814_Inherent-Resolve (accessed November 28, 2015).

climate change instability accelerants and how they may affect U.S. strategic interests globally. The strategic framework allows Yarger's interlocking ends-ways-means-risk construct to define the strategy so it can be interpreted into policy. Applying the strategy and objectives into the QDR, Global Employment of the Force (GEF), Joint Strategic Capabilities Plan (JSCP) will allow for combatant commands to include objectives in their Theater Campaign Plans and provide coordination input to the Department of State and other appropriate agencies and partners.

The framework requires a global evaluation of countries to identify those susceptible to droughts, floods, or migrations from rising sea levels, as well as an assessment of those particular states or regions. This assessment will seek to address the threat adequately and to examine possible mitigation approaches to strengthen a state's ability to absorb the adverse effects of climate change. In order to develop climate change strategy, one must also identify the strategic environment.[48] As Homer-Dixon's research indicates, two tools are paramount in identifying the basis on which the climate change strategy framework hinges: modeling capability and scenario-driven exercises.

The Ends – Strategic Framework Function

Modeling capabilities provide the predictive capability and trend analysis to identify those states and regions that reside in areas prone to drought, flooding, or rising sea levels. Coupled with geospatial data, scientists can track global climate change trends and bounce the trends off past historical predictions to gain confidence in past model patterns that predicted current conditions. Modeling and simulating climate change

[48] Yarger explains this strategic environment consists of the internal and external context, conditions, relationships, trends, issues, threats, opportunities, interactions, and effects that influence the success of the state in the relation to the physical world, other states and actors, chance, and the possible futures. Harry Yarger, *Strategic Theory for the 21st Century*.

patterns gives decision-makers, strategists, and planners a tool to focus efforts for understanding the strategic environment and provide a basis for scenario development.

Different models synthesize multiple amounts of data and provide a basis to develop scenarios where strategists may develop linkages to climate predictions and fragile nation states that may have difficulties mitigating the climate change effects. The data then allows DoD to investigate measures to help mitigate developing risks or accelerants to instability similar to Syria. Had policy and decision makers known the drought conditions in Syria were going to persist and understood how much Syria relied on agricultural production, a concerted effort to encourage agricultural reforms and improved irrigation techniques could have been encouraged. The data sets were available to foresee Syria's extensive drought.[49] Models assist in collecting data that illustrate climate change trends. However, strategists must make use of the information available, pull it all together and develop an understanding of the effects these trends have on the strategic environment, which can be realized through scenario-driven exercises.

Christine Youngblut with the Institute for Defense Analyses presents scenario-driven exercises as one method available to assist strategists gain an appreciation for the complex relationships between "climate, environmental, social, economic, cultural, political, and other factors."[50] She contends scenario-driven exercises also give strategists a greater understanding of how difficult it is to plan to mitigate climate effects, where efforts may take years, and the solutions available may be complicated. Without

[49] Food and Agriculture Organization of the United Nations, *Syrian Arab Republic, Joint Rapid Food Security Needs Assessment*, (New York: United Nations, 2012), 7.
[50] Christine Youngblut, *Climate Change Effects: Issues for International and US National Security*, (Alexandria, VA: The Institute for Defense Analyses, 2009), 17.

scenarios, she argues, it is difficult to plan for the unknown.[51]

Scenario-driven exercises also serve as a venue to bring together stakeholders, such as DoS, U.S. Agency for International Development (USAID), or Department of Agriculture (DoA), to assist in developing a strategic framework to take into consideration as many perspectives as possible. The opportunity for each of the stakeholders to identify concerns, constraints, opportunities, and risks may not otherwise exist unless they are brought together in a common setting to role play the variables and effects of a scenario, which will contribute to a greater understanding of how critical climate change instability accelerants influence other key factors within a given region or key state.

DoD Organizations Available to Develop the Framework

In order to identify who in the DoD is best suited to develop the strategic framework for climate change, it is also important to analyze the organizations within DoD most closely interconnected to climate change, understand their functions, and determine their planning horizons. Within DoD there are offices, organizations, and commands responsible for strategy, planning, and organizing; however, their focus and planning horizons restrict what and how far into the future they plan.

The organizations most closely linked to regional areas across the globe are the geographic combatant commands (GCCs). In July 2015, Congress requested the Under Secretary of Defense for Policy to provide a report identifying "the most serious and likely climate-related security risks for each Combatant Command."[52] Congress

[51] Ibid.
[52] U.S. Department of Defense, *Report to Congress on National Security Implications of Climate-Related Risks and a Changing Climate*, July 2015, 114th Congress Open-file report (Washington, DC: U.S. Government Printing Office, 2015), 2.

understands the GCCs are the closest organization to the global regions that can conduct missions to mitigate external climate change national security risks. However, the report demonstrates the resources and efforts the GCCs employ to mitigate the climate change risks primarily center on crisis related disaster response vice a TCP Phase 0 approach to mitigate accelerants to instability. The reasons GCCs are not taking a longer strategic view is due to the ambiguity in the strategic guidance and the absence of specific climate change direction in both the Guidance for the Employment of the Force (GEF) and the Joint Strategic Capabilities Plan (JSCP). The direction to develop a strategy to mitigate climate change risks needs to come from higher and must be specified in the GEF or JSCP.

One of the challenges the GCCs face with respect to planning for climate change risks is the planning horizon challenge. Since GCCs operate with a two-year planning cycle, and the climate change instability accelerants may not occur for another five to ten years, the GCCs are not organized to jump beyond their planning horizons to mitigate the future threat or develop their own approach without specific guidance. Their planning focus is doctrinally structured to focus on the current or immediate threat. In a fiscally constrained environment, similar to the sequestration challenge the nation is facing, GCCs will be less likely to apply resources to an undefined threat.[53] Given specific and directed guidance from the GEF or JSPC, GCCs would have the formal authority and requirement to apply the resources required to mitigate those climate change threats.

The Under Secretary of Defense for Acquisition, Technology and Logistics works climate change issues for DoD and established the DoD Senior Sustainability Council

[53] To read more about the effects of sequestration on DoD visit the DoD website www.defense.gov/News/Special-Reports/Sequestration

(SSC). The SSC then established the Climate Change Adaptation Working Group (CCAWG). The CCAWG, as noted earlier, focuses on climate change issues for DoD except their efforts primarily focus on fulfilling the executive order requirements for DoD, which does not include the external geopolitical climate change threats. The CCAWG may be the parallel framework already in place to spearhead an effort to develop DoD strategy aimed at assessing the national security climate change threats.

The inclusion of the climate change threat to national security is the genesis for DoD to push for a more aggressive effort to develop a strategic framework to mitigate the risk. The first step in identifying the risk is to designate a lead office to coordinate the efforts. The effort should reside at the OSD level, where policy-making and strategic guidance resides, to synthesize the information then ultimately publish strategic guidance to the GCCs for action.

The Assistant Secretary of Defense for Policy, Plans, and Capabilities is another OSD level office that could serve as the focal point to influence input to the GEF since this office develops the GEF, and originally helped to create the DEIC program. As the principal advisor to the Secretary of Defense, this office provides advice on issues concerning the National Security Strategy, capabilities, forces, and contingency plans necessary to implement the Defense Strategy. With the climate change threat outlined in the National Security Strategy, this office is best positioned to develop the National Military Strategy to support the NSS and incorporate the climate change language required for the strategy documents.

The Chairman of the Joint Chiefs (CJCS) also has a Joint Staff available to provide the information required to develop a Joint Strategic Capabilities Plan to develop directed

climate change strategic guidance. Facilitating a mitigation effort to climate change from a regional or nation state perspective will most likely happen with a joint force. The JSCP, as noted in JP 5-0, provides the "link between strategic guidance provided in the GEF and the joint operation planning activities and products that accomplish that guidance."[54] Utilizing the Joint Staff directorates and their capability, the CJCS and the Joint Staff are in a position to provide the directed guidance the GCCs require in order to initiate the planning processes at their operational level.

Another framework for the DoD to support efforts to promote stability globally is through the National Security Presidential Directive (NSPD)-44. This directive designates the Department of State (DoS) as the lead agency to coordinate with other U.S. government agencies to plan and execute stabilization and reconstruction efforts for countries at risk for conflict or civil strife. The purpose of this framework essentially mirrors the intent of the climate change instability accelerator strategy, to prevent conflict or mass migrations. The DoD could urge its efforts through this construct to push for identifying those at risk countries or regions and impose climate change prediction information to further refine the risk and operate with an interagency approach using this construct.

The organizations exist within DoD and DoS to develop the necessary climate change framework to approach the threats to instability. Developing a strategy by applying ends, ways, means, and risk will require a lead agency to pull together the necessary information from country studies, to climate change modeling capabilities, working through scenario-driven exercises to discover unplanned variables, and over-laying them

[54] U.S. Joint Chiefs of Staff, *Joint Publication 5-0, Joint Operation Planning* 11 August 2011 (Washington, DC: U.S. Government Printing Office, 2011), II-6.

together to identify the potential threats. Given the available organizations, the SSC appears to be the best organization to establish the framework and ensure linkage with OSD, the Joint Staff, and DoS.

The Means – Resources Available

Capability for strategic formulation within DoD does exist, nonetheless, it will take an interagency and even a multi-national approach in some cases, to support a global climate change strategy framework: the U.S. Department of State (DoS) and the U.S. Agency for International Development (USAID) are important and essential elements.[55] The strategic framework, once established must be properly resourced using appropriate elements of national power – diplomacy, information, military, and economics (DIME). The DoS is a resource available to assist the GCCs in engaging the countries within their regions to begin the climate change dialogues once strategy is developed.

As the lead agency in Presidential Directive-44 to execute stabilization and reconstruction efforts for those countries at risk for conflict or civil strife, the DoS has the capability to engage others and pull together the appropriate personnel and agencies to address climate change issues. A current example of the DoS engaging with another nation regarding climate change mitigation is Colombia.[56] Currently the DoS is working with the Columbian government to promote efforts for mitigating climate change in

[55] One of USAID missions is the President's global climate change initiative. Incorporated within this mission set are a variety of adaptation activities geared toward helping nations become more resilient to climate change. USAID supports climate resiliency, agrarian reforms, sea level rise resiliency, sustainable landscape programs, clean energy programs, and many other climate change adaptation efforts. Together with the efforts of USAID, which is equipped with the knowledge, and serves to support DoD efforts, the resources available to help mitigate the climate change effects are already available.
U.S. Agency for International Development, *USAID Global Climate Change Initiative: Program Profiles* (Washington, DC: U.S. Government Printing Office, 2014).

[56] U.S. Department of State, "U.S. Relations with Colombia Fact Sheet," http://www.state.gov/r/pa/ei/bgn/35754.htm (accessed December 13, 2015).

partnership with USAID. These efforts include agrarian reform, sustainable land practices, crop rotation practices to adapt to precipitation patterns, and also introducing sustainable energy alternatives to reduce greenhouse gas emissions.

Within the DoD, the combatant commands are the agencies that doctrinally would put together a plan to implement the guidance and missions outlined in the GEF. The DEIC program mentioned earlier is a security cooperation and nation-building program that currently exists and is available to the GCCs. Leveraging the DoS and USAID within the construct of the DEIC program is a means available to the DoD to pursue climate change mitigation efforts with just a minimum amount of strategic guidance.

A Way - Strategic Framework Refutes Nay-Sayers

Some would argue climate change does not pose a risk to national security. The George C. Marshall Institute recently published a report citing the climate change connection to national security was simply an attempt to "motivate action on climate policy."[57] The article presents the case that many experts cite environmental concerns as a variable to conflict only after a conflict occurs and when a convenient casual relationship between conflict, a weak nation, and climate change can be established. The argument suggests the political polarization in the U.S. to ignite climate change adaptation relies on "conjecture and expert opinion" and Executive agencies must apply resources to the climate change problem simply because the Obama administration states that climate change is a national security problem and a threat.

To counter the George C. Marshall Institute's assertion that "climate-security argument is dangerously overstated and designed to serve a domestic political purpose

[57] George C. Marshall Institute, *Connecting Climate and National Security* (Arlington, VA: George C. Marshall Institute, 2015), 30.

more than filling a void in strategic thinking," look no further than the water scarcity issue occurring in Yemen, never mind that Homer-Dixon predicted a conflict in Syria due to water shortages during the 1970s.[58] Similar to Syria, Yemen is facing a water shortage due to drought conditions. The Institute argues global actors simply react to environmental calamities as they occur and only affordable energy is associated with peace. Yet Yemen proves that conflict over scarce resources occurs regularly negating the need for conjecture and empirical data to demonstrate that conflict may occur over resources. If Yemen continues to allow its fate to play out without water mitigation intervention, and simply reacts (as the Institute suggests), then mass migration may occur and inflict future turmoil in an already troubled Middle East.

Since at least 2006, scientists have been aware of the water crisis in Yemen. The capital, Sana'a, is predicted to be one of the only capital cities in the world to run out of water within the next ten years.[59] For years, Yemen lacked regulatory control over drilling water wells. An ABC news report in 2009 exposed the internal conflicts Yemen experienced from demonstrations to riots as well as civil war regarding water.[60] The conflicts arose due to limited access to water and the inability of the government to regulate well drilling. The country has many illegal wells and the groundwater source for the capital is being depleted four times faster than it can be replenished. To replenish water, the government is paying to ship water in, a cost that is not sustainable given the current internal conflict and the decline in the country's oil reserves, which make up 25

[58] Ibid.
[59] John C. Rudolf, "In Yemen, Water Grows Scarcer," *The New York Times,* October 2010, http://green.blogs.nytimes.com/2010/10/25/in-yemen-water-grows-scarcer/?_r=0 (accessed December 12, 2015).
[60] Laura Kasinof, "At Heart of Yemen's Conflicts: Water Crisis," *The Christian Science Monitor.com,* November 2009, http://www.csmonitor.com/2009/1105/p06s13-wome.html (accessed December 12, 2015).

percent of the gross domestic product. Indeed, Rudolf wrote in the *New York Times* article, the government's "ability to provide basic services to the people is weakening." [61] The rural areas do not have sufficient infrastructure in place to provide water for the current rural population, as their resources are diminishing as well.[62] The population in Yemen is 26 million people with more than 1.7 million in the capital city of Sana'a.[63] If the city runs out of water for these 1.7 million people, can nay-sayers such as the George C. Marshall Institute not perceive this as a threat to national security?

Another failed state in the Middle East would be a global concern, with potentially up to 26 million displaced persons moving into neighboring countries. Identity conflicts, unemployment, stressed social services, and other effects could disrupt the Middle East with another mass migration. Like Syria, Yemen could become a mass migration crisis, accelerated by climate change phenomena. From a strategic perspective, the costs of doing something would far outweigh the costs of ignoring the problems until Yemen reaches its tipping point.

Using Yemen as a test case for the framework, two diagrams below illustrate how the recommended strategic framework could apply to address the growing threat in Yemen. The first diagram uses the Homer-Dixon model to depict the variables at play within Yemen. In the proposed strategic framework construct, the SSC would develop an understanding of the strategic environment using a methodology similar to the Homer-Dixon chart and then provide a recommendation to OSD-Policy to incorporate the

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[61] John C. Rudolf, "In Yemen, Water Grows Scarcer," *The New York Times*, October 2010, http://green.blogs.nytimes.com/2010/10/25/in-yemen-water-grows-scarcer/?_r=0 (accessed December 12, 2015).
[62] Laura Kasinof, "At Heart of Yemen's Conflicts: Water Crisis," *The Christian Science Monitor.com*, November 2009, http://www.csmonitor.com/2009/1105/p06s13-wome.html (accessed December 12, 2015).
[63] Central Intelligence Agency, "Yemen Factbook," https://www.cia.gov/library/publications/the-world-factbook/geos/ym.html (accessed January 20, 2016).

analyzed information into the GEF. Intelligence analysts, environmentalists, climatologists, scientists, policy experts, DoS, USAID, and the like would contribute with the SSC to develop the product.

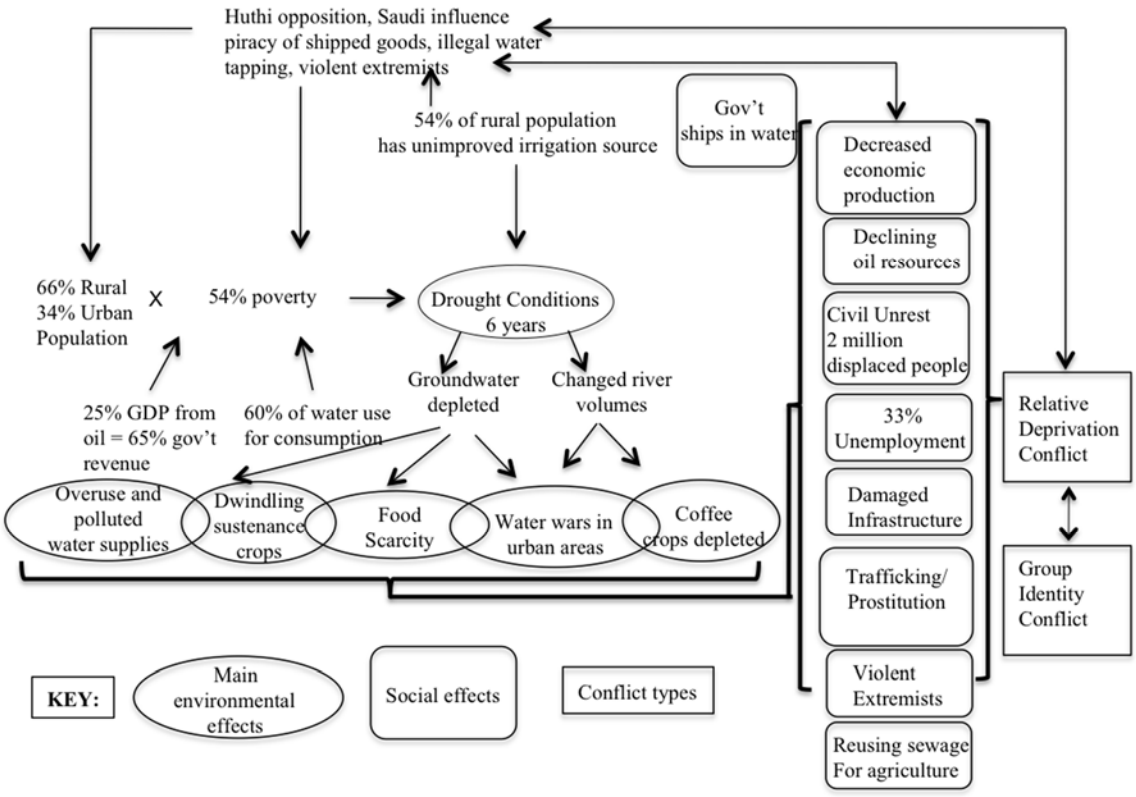

Figure 3. Homer-Dixon Environmental Change and Acute Conflict Diagram as it relates to Yemen[64] Data provided by the author.

The second diagram illustrates a working schema of how the DoD strategic framework would function to build an approach targeted toward Yemen. Using the SSC organization, the analysis of the strategic environment would feed the input to the GEF and other strategic guidance documents, which in turn would provide input for the Chairman, Joint Chiefs of Staff to develop the Joint Strategic Capabilities Plan. The

[64]Central Intelligence Agency, "Yemen Factbook," https://www.cia.gov/library/publications/the-world-factbook/geos/ym.html (accessed December 12, 2015).

strategic framework would be in motion and call the GCCs into action to incorporate the climate change strategic guidance into their Theater Strategies and TCPs for Phase 0 operations. The framework allows for the integration of interagency coordination at all levels of developing strategy and planning, through execution. Risk would be taken into consideration throughout the strategy guidance development down through execution.

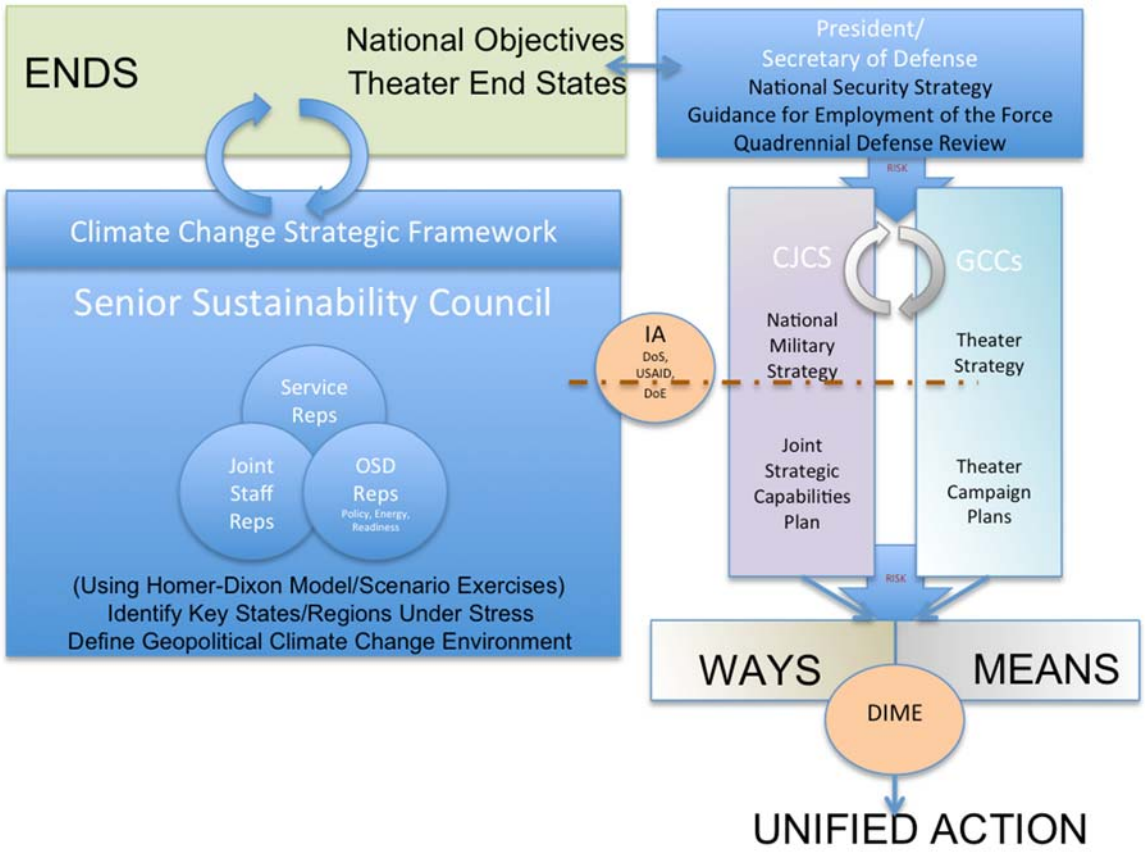

Figure 4: DoD Climate Change Strategy Framework Schema

The schema, as applied to Yemen, allows strategists a coordinating body approach to identify those issues that threaten Yemen and allow for dialogue on potential mitigation measures. The recommendations would then be forwarded to OSD for inclusion in the GEF and subsequent QDRs. Through the development of the operational strategy and

planning, GCCs would coordinate with interagencies to determine available means and ways, and analyze risk to reach the desired goals and objectives. Potential approaches to address the Yemen water crises for Phase 0 operations may include diplomatic engagement on providing water reclamation techniques, economic support by calling on the international community to assist the government in providing water for its people, and military support through the DEIC program assisting to increase improved water sources in the rural areas.

Without a strategic framework to identify the risks and issues in Yemen, the U.S. may find itself reacting to a crisis made worse without having had the opportunity to determine the strategic environment. This framework would serve to quantify the assertions made in the current strategic guidance documents that climate change is a threat to national security and bring the elements of power in a call to action.

Conclusion

Regardless of the debate of whether or not humans are causing climate change, the President of the United States has declared climate change as a threat to national security. The Department of Defense has been given specific guidance as an Executive agency to support the President and Congress in combating the threats to national security. The first step in combating the climate change threat is to develop a strategic framework identifying the threats.

Clarifying the regional climate change threat is not an easy task, as the geopolitics of the world forms an external threat to the U.S. from weak nations who cannot absorb the effects of climate change thus creating conflict or forcing their populations to migrate.

Identifying weak nations and predicting the contribution climate change phenomena could add to conflict is not an effort the DoD can take on without having a lead agency bringing together the complex requirements and information to produce an end state for each of the geographic combatant commands. The GCCs currently do not have definitive guidance to tackle the threats to climate change from a geopolitical perspective and are constrained by resources to focus on those emergent tasks and the direction the GEF provides. To advance reduction of the climate change threat, the GCCs need specific guidance to act on; this guidance is in the form of the GEF or JSPC.

To develop the GEF, the DoD must designate a lead agency. The construct within the DoD and the interagency environment exists to serve as the lead agency and develop the strategy. The Senior Sustainability Council construct is already in place and charts the precedent for addressing climate change issues. Incorporating this effort is not something that can happen overnight and will require the investment of manpower and time. It may require additional personnel with climate expertise, modeling capabilities, and growing a staff in the midst of headquarters' reductions. However, as Yarger states, "to create more favorable outcomes than might otherwise exist by chance or at the hands of others," a strategic framework must be developed.

The tools and manpower exist to identify those regions and fragile nations susceptible to instability accelerants from climate change. Scenario-driven exercises detail how the variables within the complex strategic environment affect one another, and the expertise within the interagency is available to work with DoD to help identify a way forward toward mitigating those climate change threats to national security. With the right analytic tools, strategic methodology, and strategic-minded personnel, DoD can work to

seal the gap in its own climate change strategy to mitigate the external threats to national security.

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