

## **Climate Change and Security**

Grace Haskin  
Conflict Management and Resolution Graduate Program  
University of North Carolina Wilmington  
Wilmington, NC 28412  
ghaskin08@gmail.com

### **Abstract**

Climate change poses a considerable amount of national and international security risks. While there is uncertainty surrounding the projections of climate change, it is not an excuse for delaying action. The global temperature is rising at a rapid pace, which will increasingly result in melting glaciers, heightened sea levels, heat waves, flooding, heavy rainfall, desertification, disease, scarcity of resources and ultimately, conflict. Some of these consequences, such as the melting glaciers and heightened sea levels are already prominently visible. In order to reduce the unfortunate outcomes of climate change, extensive and rapid reductions in CO2 emissions must be made.

**Key Words:** Climate Change, Global Warming, National Security, International Security, Environmental Security, Human Security, Sustainable Security, Transnational Threats, Conflict

### **Introduction**

National security threats are typically perceived as conflicts between states or populations of people and are addressed with military strategies. However, conceptualizing security threats from this perspective only narrows forethought in strategizing for national and international safety, as not all security threats emanate from nations in conflict. Environmental issues, such as deforestation and water pollution lead to scarcity of resources and destabilization, which can threaten security. These environmental scarcity issues generate conflict by weakening social and political structures (Homer-Dixon, 1999).

The environment as a national and international security issue is not a new concept. In 1977, environmental analyst Lester Brown highlighted that military involvement in national security assumes that security risks come from countries outside our borders. However, security threats “may now arise less from the relationship of nation to nation and more from the relationship of man to nature” (p. 5). In 1991, Homer-Dixon wrote that human influence on the environment could lead to national and international security implications. Kaplan (2000) also identified the environment as the major security concern of the century. What is new about the environment as a national security issue is the amount of information now available on climate change, which, according to Parsons (2010), sets it apart as a greater security threat than any other environmental issue.

Whereas policy makers have discussed the environment as a national security issue for decades, climate change, specifically, as a national security threat has generated much attention since 2007 when the United Nations Secretary General, Ban Ki Moon, said that climate change would lead to war and conflict (Parsons, 2010). According to the U.S. Department of Defense (2014), climate change hinders the military’s ability to protect the United States and in this way,

directly threatens national security. A White House report (2015) highlighting national security ramifications of climate change states the consequences of climate change are already visible globally and are presenting immediate domestic and international security threats. As developed countries, the United Nations, and NGOs, such as the Red Cross, investigate global warming and its repercussions, it is clear that climate change will remain on national and international security agendas (Parsons, 2010).

According to NASA (2015), 97 percent of the scientific community agrees that climate change is occurring and will have a lasting influence on the world if it is not promptly addressed. In spite of the warnings, policy to combat climate change has been moving at a sluggish pace. This paper examines climate change from a security perspective, primarily exploring the implications of climate change as a national and international security threat. First, a critique of the skepticism and uncertainty that saturates the topic of climate change will be provided. A brief review of the cause of climate change will follow. Next, a forecast for potential consequences of climate change if not addressed will be outlined. Then, a summary of current policy, preparedness, and the growing international response will be covered. Finally, the paper will close with recommendations for mitigating the devastating costs of climate change, as at this point, there is evidence for and preponderance of irreversible, negative global effects of climate change.

### **Skepticism and Uncertainty**

Despite overwhelming agreement among the scientific community, policy makers continue to debate climate change. Much skepticism and uncertainty surrounding the topic remain. Many argue that climate change has been securitized, which is seen as positive by some and negative by others (Parsons, 2010). Those opposed to the securitization of climate change argue that global warming is a political issue and should not be a concern of national security. On the other hand, Parsons (2010) argues that even those who denounce the domestic securitization of climate change recognize the risks to human security. In spite of cautions by the scientific community, division on the issue remains, stunting efforts to interrupt destructive environmental trends.

Some deny that the climate is even changing. Yet, the United Nations' Intergovernmental Panel on Climate Change (IPCC), an internationally accepted authority on climate change, reports that the observed warming of the planet is undeniable (2014). Much of the uncertainty surrounding climate change is not whether the global warming phenomena is occurring, but what will happen because of climate change (Victor, 2004). In response to the skepticism of future predictions, the U.S. Department of Defense (2014) has stated that uncertainty over climate change projections is not an excuse for delaying action. In the Center for Naval Analyses (CNA) Military Advisory Board's 2014 report on National Security and the Accelerating Risks of Climate Change, General Gordon Sullivan highlighted the nature of risk analysis and emergency preparedness. He explained, "...we never have 100 percent certainty. If you wait until you have 100 percent certainty, something bad is going to happen..." (p. 1). Indeed, certainty only comes with the onset of disaster, and at that point, prevention is useless, as the focus of intervention becomes recovery.

## **Cause of Climate Change**

The major consensus is that climate change is caused by anthropogenic global warming due to greenhouse gas emissions in the atmosphere (Parsons, 2010). When heat from the sun enters the earth's atmosphere, either the earth absorbs it or reflects it off its surface back into space (Environmental Protection Agency, 2015a). As heat is absorbed, the earth naturally releases heat back into the atmosphere (Environmental Protection Agency, 2015a). Greenhouse gases, such as carbon dioxide (CO<sub>2</sub>), methane, and nitrous oxide, soak up this heat and keep it trapped in the atmosphere, which results in increased temperatures (Environmental Protection Agency, 2015a). This phenomenon is termed the greenhouse effect. While these gasses occur naturally on earth, human influence has dramatically multiplied their concentrations (Environmental Protection Agency, 2015a).

The IPCC (2014) reports that because of global population and economic expansions, anthropogenic greenhouse gas emissions are the most elevated they have been in history. This growth in population and industry has significantly amplified the amount of food and energy production, thereby intensifying the amount of greenhouse gas emissions. Now, CO<sub>2</sub>, methane, and nitrous oxide are at the highest levels in the atmosphere that they have been in the past 800,000 years (IPCC, 2014). As a result, this is the major driver of climate change (IPCC, 2014).

According to the Environmental Protection Agency (2015a), 25 percent of global greenhouse gas emissions result from electricity and heat production, 24 percent from deforestation and agricultural practices (livestock and crop cultivation), 21 percent from industry (fossil fuels burned for energy), 14 percent from the transportation sector (road, rail, air, and marine transportation), 10 percent from other parts of the energy sector (fuel extraction, refining, processing, and transportation), and 6 percent from buildings (burning fuel for heat or cooking). Seventy-eight percent of all greenhouse gas emissions since 1970 are CO<sub>2</sub> emissions from fossil fuel (coal, oil, and gas) combustion (IPCC, 2014). Despite policies in place to mitigate climate change, CO<sub>2</sub> levels continue to rise. According to the U.S. National Climate Assessment, levels of CO<sub>2</sub> in the atmosphere are increasing at a rate of 0.5 percent annually (Melillo, Richmond, & Yohe, 2014).

## **Implications, Consequences, and Ramifications**

According to the IPCC (2014), the Northern Hemisphere has been warmer in the past 30 years than it has been in 1400 years, and it is getting progressively warmer. The United States' Director of National Intelligence, James Clapper (2015), says that from 1951 to 2014, the average surface temperature of the earth rose approximately 1.4 degrees Fahrenheit – 2014 being the warmest the earth has been since temperature has been recorded. Arctic temperatures are increasing double the speed as the rest of the globe, which is causing glaciers to melt and sea levels to rise (The White House, 2015). In 2012, ice coverage of the Arctic region was more than one million square miles lower than historic averages (CNA Military Advisory Board, 2014). This means geography is changing. Along with rising temperatures, the world is also experiencing more frequent and intense weather-related disasters (e.g., hurricanes, tornados, tsunamis), heat waves, desertification, droughts, floods, wildfires, ocean acidification, and species' extinctions (Melillo, et al., 2014; Parsons, 2010). These climate change induced anomalies bring many security implications.

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The projected security implications of climate change are not secluded to a single area, and the effects will manifest in unique ways depending on the region (The White House, 2015). Domestically, urban coastal areas will be the first affected (The White House, 2015). The potential for rising sea levels, storm surges and flooding put hurricane evacuation routes and transportation systems (e.g., airports, ports and harbors, roads, rail lines, tunnels, and bridges) along the coast at high risk (The White House, 2015). Roads, rail lines and airport runways are already crumbling, rusting, and cracking due to increased temperatures (CNA Military Advisory Board, 2014).

Climate change will also affect other parts of the United States' critical infrastructure, such as an escalation of energy demands due to warmer summers (The White House, 2015). Changes in water accessibility will decelerate energy production, which could disrupt basic necessities, inclusive of electricity for lighting, heating, cooling, cooking, and fuel for transportation (The White House, 2015). Because 80 percent of the United States' energy sector is controlled by private corporations, if energy production ceased, the government could not compensate for the loss or manage energy issues independently (U.S. Department of Homeland Security, 2015).

The United States' government is also not prepared for the geographical changes now occurring in the Arctic region. Historically, this region has remained widely inaccessible. Now, as arctic ice disappears, accessibility to more efficient transit routes will cause increased ship traffic through the area (The White House, 2015). The melting glaciers will also allow for a proliferation of human activities, including fishing and tourism. Unfortunately, while this allows access to newly available resources and transit routes, the United States and international community remain unprepared for this influx of human activity and development in the Arctic region (CNA Military Advisory Board, 2014).

Beyond environmental degradation, the U.S. Department of Defense (2014) says climate change will exacerbate current threats and problematic global issues of hunger, poverty, infectious disease, political instability, terrorism and conflict. Clapper (2015), adds that climate change will likely intensify humanitarian crises. Stern (2007) asserts climate change will alter the most basic life essentials, such as food and drinkable water, for hundreds of millions of people across the globe. Water shortages as a result of climate change could lead to the destabilization of countries that already have weak political infrastructures and limited financial resources—those specifically in North Africa, the Middle East and South Asia (Clapper, 2015). Even more developed nations will eventually be confronted by social upheaval due to water shortages; however, they are more capable of handling these crises and face less risk of state failure than underdeveloped ones (Clapper, 2015). While climate change will afflict all parts of the world, risks are not equally allocated (Clapper, 2015). The poorest people and lesser-developed societies will endure the effects first and most intensely, despite the fact that they contribute the least to climate change (Homer-Dixon, 1991; Stern, 2007; Clapper, 2015).

Supplies of freshwater are diminishing, and Clapper (2015) notes this could potentially prevent countries from producing food and energy, which will impede the global economy. World Bank economist, Nicholas Stern (2007), calls climate change the largest economic blunder the world will have ever experienced. The costs of climate change are rising, even within developed countries (Stern, 2007). The estimated total cost will be a loss of 20 percent of the world's GDP if nothing is done, compared to an estimated cost of 1 percent of the world's GDP if action is taken to stabilize greenhouse gases in the atmosphere in the near future (Stern, 2007). In short, the economic advantages of confronting climate change now are far greater than

the costs of inaction (Stern, 2007). Stern (2007) compares this inaction to the economic risks the Great Depression and world wars posed last century. We are at a tipping point—the steps taken over the next 20 years will have a significant influence on the climate of the next century (Stern, 2007). If climate change is not successfully managed now, the disastrous effects could prove irreversible (Stern, 2007).

A decline in resources, coupled with increases in climate change and population expansions, could prompt colossal migrations of people and competition over insufficient resources (Parsons, 2010). The CNA Military Advisory Board (2014) projects climate change will deepen poverty, environmental deterioration, political instability, and social tensions, noting that these circumstances could lead to an upsurge of terrorism and conflict. If swift action is not taken, there could be more than 200 million environmental refugees by 2050 (Parsons, 2010). As a potential side effect, Clapper (2015) suggests that terrorist groups could take advantage of the social instabilities by hijacking or depleting water supplies for the purposes of profit generation or population control. While major wars have not yet resulted from climate change, the United States' military is strategizing to manage the anticipated climate change related conflict (Parsons, 2010). Unfortunately, strategic planning has been difficult in that global populations are rapidly expanding at unprecedented rates (CNA Military Advisory Board, 2014).

In spite of military preparations, the U.S. Department of Defense (2014) says that the consequences of climate change such as rising sea levels, ocean acidification, melting glaciers, and heat waves will hinder their effectiveness. For example, military bases along the coast are vulnerable to storm surges and flooding (The White House, 2015). Additionally, projected heat waves will impair the military's outdoor training and personnel efficiency (The White House, 2015). Because of compromised bases and training, the United States' military will be unable to effectively manage threats.

In summary, the earth is getting warmer, causing geographical changes and environmental anomalies, which is projected to lead to migrations of people and conflict over scant resources. Moreover, the United States' military's response will be encumbered, so order may not be kept. All parts of the world will be affected, but it is the poorest and least developed countries that are the most vulnerable. The economic costs of delaying action outweigh the costs of addressing climate change now. If climate change is not managed soon, the results will likely prove insurmountable.

## **Projections and Forecast**

Greenhouse gasses in the atmosphere have already destined the world to a warmer climate. To what extent, however, will depend on the global amount of emissions now and in the future (Melillo, et al., 2014). According to the IPCC (2014), further greenhouse gas emissions will result in continued global warming, which will lead to extreme and permanent changes to our planet and way of life. The global aggregate of greenhouse gas emissions will determine the future of climate change (IPCC, 2014). Projections of greenhouse gas emissions are chiefly contingent on socioeconomic expansions and policies to manage climate change. However, all assessed scenarios of greenhouse gas emissions point to a rise in surface temperature over the next century (IPCC, 2014).

According to the IPCC (2014), even if anthropogenic greenhouse gases are interrupted, the effects of climate change will persist for hundreds of years. At the current rate of emissions, the amount of CO<sub>2</sub> in the atmosphere may double what it was prior to the industrialization

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period by 2035, which would bring a global temperature rise of more than 3.6 degrees Fahrenheit (Stern, 2007). If no action is taken, there is a 50 percent chance of the world's temperature rising more than 9 degrees Fahrenheit, which is comparable to the change of global temperatures from the last ice age to today (Stern, 2007). This increase in temperature will lead to a significant change in the geography of the globe, which will affect where populations reside and what lifestyle they will have (Stern, 2007). All evidence reveals climate change will enact extreme stress on our ecosystem, even at modest amounts of warming (Stern, 2007).

An estimated eight billion people will inhabit Earth by 2025 (U.S. Census Bureau, 2015). It is predicted that within two decades, the demand for food will rise by 35 percent, fresh water by 40 percent, and energy by 50 percent (CNA Military Advisory Board, 2014). In order to sustain this population growth, water, food, and energy security is essential (CNA Military Advisory Board, 2014). Because populations are expanding primarily in underdeveloped areas of the world, where food and water supplies are limited, security is particularly essential in these regions (CNA Military Advisory Board, 2014).

Parts of Africa, Asia, and the Middle East are presently experiencing climate change induced outcomes in the forms of droughts and flooding. These droughts and floods have resulted in depleted resources, land erosion, and migrations. In effect, security risks have arisen in those regions (CNA Military Advisory Board, 2014). For example, Syria recently suffered a five year drought that led to agricultural hardships and forced migration (U.S. Department of Defense, 2015). Urban areas, which were already crowded with Iraqi refugees, became inundated with rural dwelling Syrians; the population influx crippled the Syrian government's ability to respond effectively (U.S. Department of Defense, 2015). Due to such incidents, the U.S. Department of Defense (2015) warns that similar climate-related crises will increase and require a wider military presence throughout the world.

### **Current Policy and Preparedness**

In 2013, President Obama issued a Climate Action Plan; it was the first of its kind. He focused on three long-term objectives. The first goal was to cut carbon pollution in America. The second goal was to prepare the United States for the effects of climate change. Lastly, the third goal was to lead international efforts in combating global climate change and preparing for its consequences (The White House, 2013). The plan states, "While no single step can reverse the effects of climate change, we have a moral obligation to future generations to leave them a planet that is not polluted and damaged. Through steady, responsible action to cut carbon pollution, we can protect our children's health and begin to slow the effects of climate change so that we leave behind a cleaner, more stable environment" (The White House, 2013, p. 4).

In order to reach the first goal of reducing domestic carbon pollution, the plan calls for cutting greenhouse gas emissions within the energy sector and promoting clean energy projects (The White House, 2013). This goal coordinates with President Obama's pledge in 2009 to reduce 2005 domestic greenhouse gas emission levels by 17 percent by 2020 (The White House, 2013). So far, this goal has been a success, as the Environmental Protection Agency's 20<sup>th</sup> Annual Greenhouse Gas Inventory (2015b) found that while CO<sub>2</sub> emissions are increasing, overall greenhouse gas emissions declined by nine percent in 2013 from the 2005 levels.

The Climate Action Plan's second goal of preparing the United States for climate change seeks to support agencies and communities by providing them with the financial and informational resources necessary to prepare for and withstand the outcomes of climate change

(The White House, 2013). The U.S. Department of Defense (2014), too, is participating in this effort by researching and identifying its own vulnerabilities in military installations worldwide. In order to withstand extreme changes in temperature, high winds, heavy rains, wildfires, and flooding, new military bases are being constructed, and current bases are undergoing upgrades to enhance sustainability (U.S. Department of Defense, 2014).

Through initiation of global collaboration to manage climate change, the Climate Action Plan seeks to meet the third goal of leading international efforts in combatting global climate change (The White House, 2013). The United States' government is requesting international agreements for transitioning from fossil fuels and investing in clean alternative energies (Gutin, & Ingargiola, 2015). Now, two years since President Obama issued the Climate Action Plan, significant progress has been made with China, India, and Brazil. These three countries fall within the top ten nations contributing to greenhouse gas emissions (Gutin, & Ingargiola, 2015). In 2015, China, a nation responsible for 28 percent of the world's CO<sub>2</sub> emissions (Environmental Protection Agency, 2015a), agreed to place a cap on their growing greenhouse gas emissions by 2030 (Mufson, S., & Nakamura, D., 2014). This year, Brazil pledged to revitalize 12 million hectares (approximately the size of Mississippi) of rainforest by 2030 (Gutin, & Ingargiola, 2015).

Despite this progress in the mitigation and adaptation of climate change, the CNA Military Advisory Board (2014) is concerned over the insufficient response of the United States and the international community. Unfortunately, the steps that have already been taken remain inadequate to successfully manage the projected implications of climate change (CNA Military Advisory Board, 2014).

## **Recommendations**

Adaption and mitigation are the best ways to manage climate change, and according to the IPCC (2014), success hinges upon the collaboration of policy makers globally. Actions taken by the United States in isolation simply lack the power to fully ameliorate the impending colossal ramifications of worldwide climate change. Additionally, the developed world must commit to aiding the underdeveloped world. After all, it is the industrialized world that is primarily responsible for these effects. At the same time, while the technologically advanced world has greater resource capacity to withstand such disaster, the underdeveloped world has the least and is the most vulnerable to climate change (Parsons, 2010).

In order to mitigate the influence of climate change, it is imperative to make further substantial cuts to greenhouse gas emissions. Climate change is ultimately caused by anthropogenic greenhouse gases. Therefore, the most effective way to lessen the extent of climate change is through reducing these emissions (IPCC, 2014; Parsons, 2010). While the United States' military cannot manage climate change in the same way they respond to other security threats like terrorism, they remain a crucial instrument in the adaption and mitigation of climate change. For instance, as the United States' military is the largest consumer of petroleum in America (Parsons, 2010), it should lead the way in cutting consumption of fossil fuels. Reducing the military's consumption of petroleum would decrease the United States' reliance on foreign oil and increase the advancement of alternative energies. In effect, this would also reduce global conflicts over oil (Parsons, 2010). One way in which the military could lessen its consumption of fossil fuels would involve transitioning from carbon-based military transport vehicles to ones that use cleaner energy, such as biodiesel, or hydrogen—low-emission fuel

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alternatives (U.S. Department of Energy, 2014). Not only would this contribute to the mitigation of climate change, Stern (2007) predicts it would also expand business opportunities and potentially improve the world's economy. He states, "The world does not need to choose between averting climate change and promoting growth and development," (Stern, 2007, p. viii). As previously mentioned, the costs of delaying intervention are far more than the costs of confronting climate change now (Stern, 2007).

According to Stern (2007), the energy sector must cut CO<sub>2</sub> emissions globally by at least 60 percent by 2050 in order for the climate to balance within a safe range. If swift measures are not taken, the possibility of stabilization could expire (Stern, 2007). Stern (2007) suggests that greenhouse gas emissions can be reduced through energy efficiency by embracing clean, alternative sources of power (Stern, 2007). More research and action should be taken to adapt the United States' energy production to nuclear, geothermal, wind, wave and solar power, as this would significantly minimize the nation's carbon-footprint, preserve resources, and lessen long-term cost in the interest of greater security.

As deforestation and agricultural practices throughout the globe lead to more greenhouse gas emissions than the entire transportation sector (Environmental Protection Agency, 2015a), decreasing deforestation and developing more energy efficient means of agriculture are crucial. Deforestation causes the destruction of 877,000 acres (or 137,000 square miles) of forests annually in order to make room for agriculture (Melillo, et al., 2014). Deforestation not only emits greenhouse gases, it also leads to soil nutrient loss and desertification, which makes it necessary to clear more forests for agricultural space (Organic Agriculture and the Environment, 2002). Additionally, deforestation contributes to the greenhouse gas problem, in that less oxygen is released into the atmosphere, while more CO<sub>2</sub> travels to the ozone because less plant life is available to absorb it. Evidence shows that organic farming improves soil productivity, thereby countering desertification and removing the need for deforestation (Organic Agriculture and the Environment, 2002). By switching from conventional agricultural practices to organic farming, CO<sub>2</sub> emissions could decrease up to 66 percent (Organic Agriculture and the Environment, 2002).

Agriculture is not only increasing the effects of climate change, it is also affected by climate change. Temperature increases and changes in rainfall patterns directly influence plant growth (Organic Agriculture and the Environment, 2002). In order to adapt successfully to projected climate change, the United States' government should fund research on climate-resilient crops. Furthermore, education on organic agriculture should be offered and promoted worldwide. As part of Goal 3 of the Climate Action Plan, the United States could spearhead the educational platform effort, informing nations how to transition from conventional agricultural practices, which contribute greatly to climate change, to more environmentally-friendly ones, like organic farming.

While domestic mitigation policies and pledges will contribute to the most significant changes in decreasing harmful emissions, individuals can also make changes. According to The Environmental Protection Agency (2015c), people can contribute to reversing climate change through simple actions. They can do so by recycling, switching to energy efficient light bulbs, and turning off electronics when they are not in use (Environmental Protection Agency, 2015c). Alternative transportation, including walking, biking, public or shared transportation, or driving a fuel-efficient vehicle also lower greenhouse gas emissions (The Environmental Protection Agency, 2015c). Moreover, individuals can decrease the amount of water they use, in order to minimize the greenhouse gasses emitted during the treating, heating, and pumping of water (The

Environmental Protection Agency, 2015c). Emissions can also be reduced through basic lifestyle changes, switching to a vegan or vegetarian diet. According to Mekonnen and Hoekstra (2012), it takes 500 gallons of water to produce one pound of chicken and about 450 gallons to produce a quarter pound of beef. This is approximately 40 times the amount of water it takes to produce an eight ounce bag of lettuce (Mekonnen, & Hoekstra, 2011).

It is already too late to prevent the global warming that will inevitably take place over the next several decades. Adaptions must be set into motion in order to withstand the impending ramifications of climate change. Any future structural developments, including the construction of buildings, roads, and power supplies, must be designed with climate change in mind. In order to lower risks to national security, military leaders should incorporate climate change projections in strategic planning and prepare for geographic changes in the Arctic region (CNA Military Advisory Board, 2014). Adaption planning should also address the effects of climate change on food, water and energy. Lastly, all departments of government should engage in disaster preparedness exercises involving climate change projections, in order to practice for potential breeches in national security.

In summary, long-term global adaption and mitigation efforts are necessary to ease the consequences of climate change. Substantial cuts to greenhouse gas emissions need to be made, and there are a variety of ways to do this. The United States military can decrease their reliance on petroleum. The energy sector can reduce their CO<sub>2</sub> emissions by transitioning to cleaner power. Deforestation can be minimized by introducing alternative agricultural practices, and individuals can diminish emissions through basic lifestyle changes. In terms of adaption, as populations increase and human sprawl occurs, new construction and urbanization should adjust for climate change. At the same time, government should practice its responses to the impending security threats. It is only through a collaborative adaption and mitigation effort that climate change can be successfully managed.

## **Conclusion**

In 2007, the Science and Security Board of the Bulletin of the Atomic Scientists, moved the minute hand of the “Doomsday Clock,” which is a depiction of how close scientists estimate the world is to global disaster, two minutes closer to midnight. They identified climate change as being one of the reasons for the shift (Campbell & Parthemore, 2008). At the beginning of 2015, the clock was again moved ahead an additional two minutes due to increasing climate change (Bulletin of the Atomic Scientists, 2015). The metaphorical clock now sits at 11:57 – only three minutes from global disaster (Bulletin of the Atomic Scientists, 2015). The only time the clock has been closer to disaster was at the height of the Cold War in 1953. As the United States and the Soviet Union tested thermonuclear bombs, the clock was moved to 11:58 (Bulletin of the Atomic Scientists, 2015).

In review, climate change, which is caused by anthropogenic greenhouse gases in the atmosphere, poses a considerable amount of national and international security risks. While there is uncertainty surrounding the projections of climate change, it is not an excuse for delaying action. The global temperature is rising at a rapid pace, which will increasingly result in melting glaciers, heightened sea levels, heat waves, flooding, heavy rainfall, desertification, disease, scarcity of resources and ultimately, conflict. Some of these consequences, such as the melting glaciers and heightened sea levels are already prominently visible. Climate change poses unique challenges to national security in that it cannot be addressed through the

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conventions of peace treaties or military strategies. Policy and collaboration are taking place, but the efforts are not urgent or significant enough to withstand global warming. In order to reduce the unfortunate outcomes of climate change, extensive and rapid reductions in CO<sub>2</sub> emissions must be made.

Scholarly literature and government reports on national security provide well-documented evidence of climate change and its ramifications. Scientists have warned the public and policy makers of climate change repercussions, predicted future trends of global warming, and recommended solutions for decades; yet, annual global temperatures continue on an increase trajectory. As climate change affects the entire world, the issue must be addressed by everyone. Not a single nation is independently responsible for climate change. The security risks and financial implications are global and therefore, should constitute a tremendous incentive for countries to unify for the good of future generations. Instead, “climate change impacts are already accelerating instability in vulnerable areas of the world and are serving as catalysts for conflict,” (CNA Military Advisory Board, 2014, p. 2). The Doomsday Clock is ticking, and the more time the world allows to pass without making serious changes, the closer humanity is to inviting disaster and ending its own sense of security.

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