

Threat Assessment: Part III
Climate Change: A Growing Threat to National Security

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THREAT / THESIS AND ORGANIZATION

Climate change poses a severe threat to global security and political stability. The physical consequences of climate change, such as rising temperatures, sea-level rise, and extreme weather events, will have widespread ramifications. These will affect not only the environment, but national security. The urgency to achieve net-zero emissions and implement adaptive measures will fuel debates on the required speed and methods to tackle the climate crisis, potentially giving rise to heightened competition, global instability, strains on military readiness, and political discord. These challenges pose a critical and imminent threat to political harmony and cooperation on a global scale. This paper will assess the threat posed by climate change to global security and political stability. It will begin by providing an overview of the main theories used to study climate change, as well as the most recent research to support it. Additionally, it will address diverse methodologies climate scientists use to track climate-related data while also addressing their limitations and uncertainties. Finally, it will review current U.S. policy and its effectiveness while addressing security and defense challenges. Ultimately, the paper will argue that climate change is a global security threat that requires a global solution.

THEORY/THEORIES

Greenhouse Theory & Greenhouse Effect

Climate change presents a dire and imminent threat with widespread ramifications at both the regional and global level. Over the next two decades, the physical consequences of climate change, such as rising temperatures, sea-level rise, and extreme weather events, will impact

every nation.¹ The leading philosophy in climate change is the greenhouse theory. According to this theory, the climate system will be “restored to equilibrium by a warming of the surfacetroposphere system and a cooling of the stratosphere. The predicted changes, during the next few decades, could far exceed natural climate variations in historical times”.² Plainly, the Earth’s atmosphere traps heat from the sun due to certain greenhouse gasses (GHG) in the atmosphere. That trapped heat warms the Earth’s surface and atmosphere. Although the greenhouse theory and greenhouse effect are often used interchangeably, greenhouse theory is a scientific explanation for how the greenhouse effect works.³

The efforts to mitigate GHG emissions will be crucial in achieving the ambitious goal set by the Paris Agreement of limiting global warming to 1.5° C (2.7° F) by the end of this century.⁴ However, with the world inching closer to surpassing this threshold, there will be an increasing call for “geoengineering research and possible deployment to cool the planet, despite possibly dire consequences”.⁵ As countries grapple with the necessity of reaching net-zero emissions and implementing adaptive measures, debates will intensify regarding the speed and methods required to address the climate crisis. These decisions will pose significant challenges, leading to [heightened] competition, contributing to instability, straining military readiness, and

¹ Office of the Director of National Intelligence, “Environmental: Structural Forces.” Global Trends 2040, 2021.

² V. Ramanathan, The greenhouse theory of climate change: a test by an inadvertent global experiment, 1988, 293.

³ National Resources Defense Center, “Greenhouse Effect 101.” 2023.

⁴ United Nations Framework Convention on Climate Change, “The Paris Agreement,” 2023.

⁵ Office of the Director of National Intelligence, 2021.

encouraging political discord”.⁶ This could ultimately foster political discord not just regionally, but on a global scale.

Intersection of Environmental Security and National Security

James Hansen, a leading climate scientist, recently wrote that “under the current geopolitical approach to GHG emissions, global warming will likely pierce the 1.5° C ceiling in the 2020s and 2° C before 2050. Impacts on people and nature will accelerate as global warming pumps up hydrologic extremes”.⁷ Whether Hansen’s grim prediction reigns true or not, climate change is an inevitable global threat that will have far-reaching consequences. This is especially true for underdeveloped nations. The physical effects of climate change, such as higher temperatures, sea level rise, drought, and extreme weather events, are projected to disproportionately fall upon the developing world, intersecting with environmental degradation which can intensify food, water, and health insecurity.⁸ Moreover, the brunt challenges will disproportionately affect the developing world, compounding existing environmental degradation and exacerbating risks to essential aspects of human security.⁹

⁶ Office of the Director of National Intelligence, 2021.

⁷ James Hansen, Makiko Sato, Leon Simons, Larissa S. Nazarenko, Isabelle Sangha, Karina von Schuckmann, Norman G. Loeb, Matthew B. Osman, Qinjian Jin, Pushker Kharecha, George Tselioudis, Eunbi Jeong, Andrew Lacis, Reto Ruedy, Gary Russell, Junji Cao, Jing Li. , “Global warming in the pipeline,” 2023, 1.

⁸ Office of the Director of National Intelligence, 2023 Annual Threat Assessment of the US Intelligence Community, 2023, 22-23.

⁹Mukesh Chandra Dwivedi, "Assessing the Socioeconomic Implications of Climate Change." *Cosmos An International Journal of Art & Higher Education*, Vol 11, No 2, May 10, 2022, 3.

With climate change comes the threat of climate migration. While most climate migration is expected to take place within national borders, cross-border migration is also expected to increase. Researchers project that drought-induced migration could triple in the coming century if international efforts do not adequately address the escalating climate crisis.¹⁰ In April of 2021, experts from Harvard and Yale published a report on climate displacement and its widespread ramifications. It stated,

Although there are no perfect estimates for population flows related to climate change, ample scientific evidence has linked gradual and sudden environmental changes to human displacement. Since the 1990s, the Intergovernmental Panel on Climate Change (IPCC), the world's leading authority on the matter, has warned that the greatest single impact of climate change will be human migration. Scientists predict that climate change will lead to large-scale movements of people within and across borders, including into the United States.¹¹

A variety of push and pull factors can result in climate-driven migration.¹² As larger numbers of people are displaced, it can strain the capacity of host countries to absorb and integrate migrants. George Friedman, a geopolitical forecaster and strategist on international affairs, argued that countries will need to develop policies to deal with the influx of migrants.¹³ Friedman's predictions have been echoed by other experts. The United Nations (UN) has warned that

¹⁰ Mia Prange, "Climate Change is Fueling Migration. Do Climate Migrants have Legal Protections?" Council on Foreign Relations, 2022.

¹¹ Camila Bustos, John Willshire Carrera, Deborah Anker, Thomas Becker, and Jeffrey S. Chase, *Shelter from the Storm: Policy Options to Address Climate Induced Migration from the Northern Triangle*, Harvard Immigration and Refugee Clinical Program, HLS Immigration Project, the University Network for Human Rights, Yale Immigrant Justice Project, and Yale Environmental Law Association, 2021, 10.

¹² Nicholas Van Hear, Oliver Bakewell, and Katy Long, "Push-Pull plus: Reconsidering the Drivers of Migration." *Journal of Ethnic & Migration Studies*, 2018, 931.

¹³ George Friedman, *The Next 100 Years: A Forecast for the 21st Century*, 2009, 133-135.

climate change could displace up to 200 million people by 2050. From an economic standpoint, the World Bank has estimated that climate change could cost the global economy \$20 trillion by 2050.¹⁴ Migration – be it forced or by choice – will inevitably impact the host city or nation. When it comes to climate change, it is essential to understand that each piece is interconnected. While extreme weather events can lead to food and water scarcity, contention over resources, economic burdens and more, so too can migration.¹⁵

Experts have also theorized that there will be a rise in geopolitical tensions as a result of climate change. This is the prediction for issues like resource scarcity, migratory patterns, and climate financing, but also over contested land like the Arctic. The annual threat assessment released by the Office of the Director of National Intelligence (ODNI) highlighted this in stating,

As temperatures rise and more extreme climate effects manifest, there is a growing risk of conflict over resources associated with water, arable land, and the Arctic. Additional factors, such as migration, some of which will be exacerbated by climate and weather events, will heighten these risks. Contested economic and military activities in the Arctic have the potential to increase the risk of miscalculation, particularly while there are military tensions between Russia and the other seven Arctic countries following Russia's invasion of Ukraine in early 2022.¹⁶

These dynamics highlight the complex intersection between climate change and geopolitical stability, necessitating a holistic approach to address the multifaceted challenges ahead.

Ultimately, there are a wide range of broader implications both nationally and internationally as a result of climate change.

¹⁴ The World Bank, “Climate Change Could Force 216 Million People to Migrate Within Their Own Countries by 2050,” 2021.

¹⁵ U.S. Department of Agriculture, “Climate Change, Global Food Security, and the U.S. Food System” 2015, 111.

¹⁶ Office of the Director of National Intelligence, 2023, 22.

METHOD

Climate change research employs diverse methodologies. Mathematical modeling simulates future changes in the climate under different scenarios of GHG emissions. These models are based on our understanding of the climate system and can be used to predict how climate change will affect different regions of the world.¹⁷ Observational data analyzes present conditions and historical shifts. This data can come from a variety of sources, such as weather stations, satellites, and tree rings.¹⁸ It is essential for validating mathematical models and for understanding the current state of the climate system. Additionally, field experiments assess real-world impacts on ecosystems and societies,¹⁹ while more novel approaches are used as well. These include surveys to gauge public awareness and attitudes, identifying barriers to action²⁰ or case studies understand localized effects.²¹ These methods collectively enhance understanding of climate change causes and effects, informing more effective strategies for mitigation and

¹⁷ IPCC, “Summary for Policymakers. In: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change,” 2023, 9.

¹⁸ National Center for Atmospheric Research, “Climate: Investigating a Changing World,” 2023.

¹⁹ Rebecca Lindsey and Luann Dahlman, “Climate Change: Global Temperature.” National Oceanic and Atmospheric Administration (NOAA), 2023.

²⁰ Brian Kennedy, Cary Funk, and Alec Tyson, “Majorities of Americans Prioritize Renewable Energy, Back Steps to Address Climate Change.” Pew Research Center, 2023.

²¹ The World Bank, “Climate Change Could Force 216 Million People to Migrate Within Their Own Countries by 2050.” Groundswell Report, 2021.

adaptation.²²

Feasibility

While climate models are a valuable tool for predicting climate change, they also have limitations and varying degrees of uncertainty.²³ For instance, one such limitation is that they are based on our current understanding of the climate system. This means that climate models can be inaccurate, particularly for extreme events or for long-term projections.²⁴ These models aid in deciphering past climate shifts and predicting future changes, but they possess imperfections and constraints.²⁵ They can diverge in terms of complexity, grid scale, and representation of climate phenomena.²⁶ Another limitation of climate models is that they require a large amount of data. This data may not be available for all regions of the world or for all time periods which can make it difficult to use climate models to predict the effects of climate change in some areas.²⁷

²² C. Singh, M. Tebboth, and D. Spear, “Exploring methodological approaches to assess climate change vulnerability and adaptation: reflections from using life history approaches.” *Reg Environ Change* 19, 2019, 2667.

²³ J. L. Schnase et al., “MERRA Analytic Services: Meeting the Big Data challenges of climate science through cloud-enabled Climate Analytics-as-a-Service. *Computers, Environment and Urban Systems*,” 2014, 1-2.

²⁴ Schnase et al., 2.

²⁵ Renee Cho, “What Uncertainties Remain in Climate Science?” *Columbia Climate School: State of the Planet*, 2023.

²⁶ J.H. Christensen, K. Krishna Kumar, E. Aldrian, S.-I. An, I.F.A. Cavalcanti, M. de Castro, W. Dong, P. Goswami, A. Hall, J.K. Kanyanga, A. Kitoh, J. Kossin, N.-C. Lau, J. Renwick, D.B. Stephenson, S.-P. Xie and T. Zhou ., “Climate Phenomena and their Relevance for Future Regional Climate Change, “*IPCC*, 2013, 14.

²⁷ Schnase et al., 2.

Climate scientists admit that climate projections are indeed uncertain.²⁸ These uncertainties, however, does not mean that the threat does not exist. There is an overwhelming consensus amongst climate scientists that climate change is an eminent threat caused by human activity – or inactivity, depending on one’s outlook. The uncertainties lie in nuanced areas such as data collection, natural variability in the climate system, and the difficulty of predicting human behavior.²⁹ Although these uncertainties exist, the scientific community largely underscores that there are substantial risks and emphasize implementing measures to both mitigate and adapt to the threat. Climate scientist, Andrew Dessler, and Andrew Parson wrote,

“...the strength of action required is likely to be difficult and costly, at least in disruption of current policies and practices and possibly also in aggregate cost. Just how difficult and costly remains uncertain, of course, but this uncertainty cannot be resolved until the serious work begins.”³⁰

Ultimately, the uncertainties in climate projections should not be used as an excuse to do nothing. We need to act now to combat the threat of climate change, even in the face of uncertainty.

FINDINGS

Given the facts that have been presented by both scientists and the intelligence community alike, the findings of this risk assessment are that climate change poses a serious

²⁸ Andrew Dessler and Edward Parson, *The Science and Politics of Global Climate Change: A Guide to the Debate*, 2019.

²⁹ Cho, “What Uncertainties Remain in Climate Science?” 2023.

³⁰ Dessler and Parson, *The Science and Politics of Global Climate Change: A Guide to the Debate*, 2019.

threat to national security and that urgent action is required to mitigate its effects. The growing knowledge and understanding of climate change has led to a number of policy changes, both domestically and internationally. For instance, the U.S. has had a long and complicated history of addressing the climate crisis. There have been varying approaches over the past three decades to tackle climate change, and it has often been a topic of debate. In 1992, the Senate ratified the United Nations Framework Convention on Climate Change (UNFCCC), which committed all nations to take actions on climate change.³¹ The 1997, the U.S. signed the Kyoto Protocol – and international agreement to reduce GHG emissions – but later withdrew in 2021.³² Following his election, President Obama prioritized a comprehensive climate and energy bill, highlighting its significance as a key legislative objective during his term.³³ The U.S. joined the Paris Agreement in 2015 which President Trump controversially withdrew from in late 2020³⁴.

POLICY

Current U.S. Policy & Legislative Action

Scientific assessments have confirmed that GHGs have played a significant role in global warming since 1979. In the 117th Congress, the majority leadership in both the House and the

³¹ Center for Climate and Energy Solutions, “Congress Climate History.” 2023.

³² United Nations Framework Convention on Climate Change, “What is the Kyoto Protocol?” 2023.

³³ National Security Strategy, Obama White House Archives, 2010, 47.

³⁴ National Resources Defense Center, “Paris Climate Agreement: Everything You Need to Know,” 2021.

Senate have advocated for comprehensive strategies to not only reduce GHG emissions, but to also invest in clean energy technologies for the future. These commitments are seen through regulations, tax credits, and overall research and development. By actively supporting the development and implementation of climate crisis-driven policies, legislation, and emerging technologies, the U.S. is taking steps to protect its security and ensure a sustainable future not only at home, but globally.

In recent years, there has been a renewed interest in climate change, as scientists have become more alarmed about the potential consequences of inaction and have increasingly recognized the national security threats associated with it. This is due to a number of contributing factors, including the increasing frequency and intensity of extreme weather events, the ever-growing body of scientific evidence, and the overall increase in public awareness.³⁵ While different administrations have had different approaches, the Biden administration has made climate change a top priority. In his first 100 days in office, President Biden rejoined the Paris Agreement, revoked the permit for the Keystone XL pipeline, and set ambitious goals to reduce GHG emissions by 2030 and 2050, respectively. He also enacted the historical Inflation Reduction Act (IRA), which was the largest legislation ever passed to combat the climate crisis.

Today, there is a whole-of-government approach to tackling climate change, with a significant number of federal agencies having implemented climate crisis initiatives. For example, the Environmental Protection Agency (EPA) has committed itself to reducing GHG emissions from power plants, while the Department of Energy (DOE) has a strong focus on clean

³⁵ Kennedy et al., “Majorities of Americans Prioritize Renewable Energy, Back Steps to Address Climate Change.” Pew Research Center, 2023.

energy technologies.³⁶ The Department of Defense (DOD) released the *Climate Risk Analysis* as well as the *Climate Adaptation Plan*, highlighting that climate change is not only an environmental issue, but a serious security threat.³⁷

In the short term, the Biden administration has enacted new legislation to reduce GHG emissions, including the Consolidation Appropriations Act, the Energy Act, and the American Innovation and Manufacturing Act. Additionally, there is a strong focus on climate change in the President Biden's National Security Strategy (NSS) when discussing cooperating on shared international challenges. The NSS specifically states that the climate change is an existential threat to U.S. security.³⁸ This underscores the understanding that climate change poses a threat not only to our environment, but also has serious security implications.

While the current administration and its policy on climate change has made significant progress, it still faces several challenges. The Biden administration's whole-of-government approach has been met with some skepticism, as critics have doubts whether his goals can be achieved without new or enhanced appropriations from Congress.³⁹ Political opposition to climate action is still prevalent, which ultimately affects progress on several levels. Some of the technologies needed to achieve net-zero emissions have yet to be fully developed.⁴⁰ This could

³⁶ U.S. Environmental Protection Agency, "Climate Change Regulatory Actions and Initiatives," 2023.

³⁷ Department of Defense, Office of the Undersecretary for Policy (Strategy, Plans, and Capabilities). Department of Defense Climate Risk Analysis. Report Submitted to National Security Council, 2021.

³⁸ "National Security Strategy," The White House, 2022.

³⁹ Lattanzio et al, 28.

⁴⁰ Dan Lashof, 2023.

significantly hinder the ability to transition to cleaner energy sources and implement effective mitigation measures to meet the administration's 2030 and 2050 goals. Additionally, the IRA is a long-term piece of legislation, but it is possible that future administrations will not be as committed to climate action.⁴¹ These challenges, amongst others, have significant security implications both at home and abroad. Another important consideration the length of a presidential term, as the next president may reverse or repeal policies and legislation enacted by the previous administration.

Policy & International Cooperation Moving Forward

Although the Biden administration has made significant progress on climate change action, it is important to continue to address the challenges that remain. The U.S. needs to invest in new technologies, build political support for climate action, and ensure that future administrations are committed to meeting our climate goals. Future administrations should prioritize international collaboration and partnerships to address both the health and state security implications of climate change. This includes sharing best practices, knowledge, and resources with other nations, particularly those most vulnerable to climate-related health risks. By working together, states can enhance their collective capacity to monitor and respond to climate-related health threats, exchange data and information, and coordinate emergency response efforts. International collaboration can foster the development of innovative solutions and technologies to address climate-related health challenges on a global scale.

⁴¹ Alica C. Hill and Madeline Babin, "What the Historic U.S. Climate Bill Gets Right and Gets Wrong." Council on Foreign Relations, 2022.

In addition to prioritizing international collaboration, the U.S. would benefit from building public awareness and focusing on education. As studies have shown, many people may not fully understand the potential threats posed by climate change to public health and the broader implications for national security. By conducting widespread public awareness campaigns, utilizing various media platforms, and engaging with communities, the U.S. can educate citizens about the risks associated with climate change. This awareness and education can play a pivotal role in equipping individuals with the knowledge and skills needed to address current and future security challenges.

Security and Defense Challenges

Today, climate change currently presents a significant challenge to U.S. national security and defense. While climate change is often thought of as an environmental threat or as an issue for our future, the DOD has reshaped its strategic, operational, and tactical environments in order to adapt to its current *and* future threats.⁴² This is emphasized in the DOD Directive 4715.21, “Climate Change Adaptation and Resilience” as well in other directives and initiatives.⁴³ Moreover, the DOD has recently “sought to increase military readiness and may propose changes in military equipment or force structure in anticipation of increased operations due to climate change”.⁴⁴ This is an added issue, as DOD officials have recognized the financial implications

⁴² Department of Defense, 2.

⁴³ Department of Defense, 1.

⁴⁴ Hibbah Kaileh and Kelley M. Sayler, “Climate Change and Adaptation: Department of Defense.” Congressional Research Service, 2022, 1.

and risks, as it not only could affect “military installations and associated equipment,” but also have a significant impact on military supply chains.⁴⁵

APPLICATION

Personal Reflection

Researching the threat of climate change has enhanced my understanding of the topic in a number of ways. First, it has helped me to understand the scientific consensus on climate change. There is overwhelming evidence that climate change is real, that it is caused by human activity, and that it is already having a significant impact on the planet. Second, my research has helped me to understand the different ways in which climate change can impact human security. Third, my research has helped me to understand the importance of international cooperation in addressing climate change. My research for this paper has allowed me to explore previous environmental policies and the U.S.’s response to the threat which is an area that I had not focused on in such detail previously. This helped me understand how politics have changed and how different administrations have adapted to the increasing scientific body of work surrounding the climate crisis.

Although I have written about this topic fairly often throughout my studies, I always find new academic research not only about new scientific discoveries, but about the national security implications surrounding climate change. This information can be used to shape and maintain a strong security policy in a number of ways. First, it can help us to better understand the risks posed by climate change and to develop strategies to mitigate those risks. Second, it can help us

⁴⁵ Kaileh and Sayler, 1.

to build international cooperation on climate change, which is essential to addressing the problem. Lastly, it can help us to develop future policies that address the root causes of climate change. I wholeheartedly believe that climate change is an existential threat and one of the most important security challenges facing the world today. By understanding the complexity of the threat and taking action to address it, we can help to build a more secure and sustainable future for all.

As this paper is being written, the world is coming off of the hottest month ever recorded in our history.⁴⁶ In 2023 alone, we have witnessed wildfires in Canada and Chile, unprecedented heatwaves across Europe and Asia, and a record breaking cyclone in Africa.⁴⁷ Unfortunately, this is the world's new norm. The World Meteorological Organization recently released a report that states that there is a 66% likelihood that the “annual average near-surface global temperature between 2023 and 2007 will be more than 1.5° C above pre-industrial levels for at least one year”.⁴⁸ Even more concerning is its report that there is a 98% chance that at least one of the next five years will be the warmest ever recorded.⁴⁹ The urgency of the topic today cannot be overstated as we are already witnessing the impacts of climate change. These impacts not only threaten the environment but also have global security consequences⁵⁰ While the outlook for

⁴⁶ Lauren Sforza, “July was officially the hottest month on record, scientists say.” The Hill: Energy and Environment. 2023.

⁴⁷ Khanya Mlaba and Fadeke Banjo, “Shocking Photos of Extreme Weather Around the World in 2023 So Far.” The Global Citizen, 2023.

⁴⁸ World Meteorological Organization, *WMO Global Annual to Decadal Climate Update*, 2023, 6.

⁴⁹ World Meteorological Organization, *WMO Global Annual to Decadal Climate Update*, 2023, 6.

⁵⁰ Thomas Vinod, *Climate Change and Natural Disasters*, 2017, 4.

climate change may seem bleak, there is hope. We have the tools we need to address climate change. We can reduce our emissions, change our lifestyles, and invest in new technologies. If we act now, we can avoid the worst impacts of climate change and build a better future for ourselves and for generations to come.

CONCLUSION

As recognized in the annual threat assessments released by the ODNI, the intelligence community has increasingly recognized climate change as a threat to national security. That being said, I knew it would be a challenging topic to create a threat assessment about. I certainly faced various hurdles researching a topic that has long been a contentious subject. My aim for this threat assessment was to highlight that climate change is a multifaceted threat to human, state, and global security, which requires urgent and concerted efforts at national and global levels. The impacts of climate change on natural disasters, food security, and displacement of people highlight the need for proactive measures to mitigate and adapt to these challenges. I addressed both past and present policies to show that as our understanding of climate change has evolved, so too must our policies. Moving forward, it is crucial for the U.S. and other nations to not only recognize the national security implications of climate change but also translate this recognition into concrete actions to ensure a sustainable future for all. By working together, we can foster a resilient and sustainable future.

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