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# **UConn Political Review**

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**The Editorial Board and staff thank the UConn Department of Political Science for their help in creating this semester's edition.**

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Letter From the Editor

Dear Readers,

It is a privilege to write to you as the Editor in Chief of the University of Connecticut Undergraduate Political Review. The theme of this semester's publication is **"Environmental Politics and Policy in the Age of Trump."** This topic discusses the implications of environmental policy issues, such as climate change, international security, sustainability, fossil fuels, renewable energy, pollution, natural resource use, conversation, global health, environmental justice, technological advancement, population growth, and multinational trade and/or environmental agreements during the Trump Presidency and beyond.

This semester, the UPR staff and Editorial Board have carefully written their articles, produced new perspectives within environmental politics, and asked difficult questions about domestic and international politics, as they relate to the current administration's policies. This edition features a variation of topics, which we take pride in. The integrity with which the UPR staff approaches their writing is further evident in the thoughtfulness of their articles, as well as their use of research and evidence to inform discussion around environmental issues. Based on their writing, this edition showcases and engages with complex environmental policy issues and significant questions about the future of this planet we all share and must protect.

The Undergraduate Political Review releases one new edition each semester. We accept new writers regularly and always encourage talented undergraduates interested in politics to apply. UConn students, of any major, interested in writing for the UPR may email a resume and writing sample to Austin Beaudoin, the UPR Editor in Chief for the 2018-2019 academic year (Congratulations, Austin!), at [Austin.beaudoin@uconn.edu](mailto:Austin.beaudoin@uconn.edu), or to the UPR, at [uconnpoliticalreview@gmail.com](mailto:uconnpoliticalreview@gmail.com).

Lastly, I thank the Undergraduate Political Review editors and writers for their persistence and hard work this semester. I also thank the Political Science Department for its continuing support. We lastly thank the UPR's faculty adviser, Professor Oksan Bayulgen, and Political Science Department Head, Professor David Yalof, without whom the Undergraduate Political Review would not be possible.

Sincerely,

**Nicholas Fuller**  
Editor in Chief

# Trump's Clean Coal: U.S. Energy Security and the Politics of Climate Change Denialism

By Derek Koundakjian

The Trump Administration and the United States Department of Energy have made clear their objective to revitalize the coal industry in America. By way of an executive order to roll back the Clean Power Plan, an Obama-era initiative that enforces carbon pollution limits,<sup>1</sup> President Trump has attempted to fulfill a campaign promise that will “end the theft of American prosperity and revive our beloved American economy.”<sup>2</sup> Through his political adroitness, President Trump has labeled coal as a priceless commodity, which will revitalize the economy and aid struggling working class Americans. As the President said in his first seven months in office, “We’ve ended the war on beautiful, clean coal, and it’s just been announced that a second, brand-new coal mine, where they’re going to take out clean coal — meaning they’re taking out coal. They’re going to clean it!”<sup>3</sup>

Despite the numerous environmental implications of a coal mining resurgence, President Trump is facing little backlash from the rural American demographic. Rural Americans have largely been swayed by his campaign assertion that working-class Americans are being robbed blind by frivolous government regulation. It is perhaps his campaign slogan, “Make America Great Again,” centered on a vision of a United States that embraces the rugged blue-collar aesthetic of the coal miner,<sup>4</sup> that is keeping the rural population quiet in anticipation, believing the time for their economic prosperity has finally arrived. By deceiving his audience, Trump has gained momentum in lifting bans on mining in public areas and rescinding environmental regulations put in place to keep our terrestrial and atmospheric ecosystems alive and healthy. Although the costs of a resurged coal mining industry include air pollution perpetuating climate change and widespread environmental degradation, the U.S. interest in maintaining American energy security has led President Trump to add a new and deceptive adjective to coal mining: *clean*.

In addition to the Trump Administration explicitly stating its interest in preserving coal as a major component of U.S. energy security, they plan to rely on it for cheap energy needed to improve domestic infrastructure as well. To achieve his infrastructure objectives, Trump has asked for support from both the Republican and Democratic parties to move forward with initiatives to rebuild America’s “crumbling” roads, airports, and bridges. “I am asking both parties to come together to give us the safe, fast, reliable, and modern infrastructure our economy

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<sup>1</sup> NRDC. (2018, January 09). What Is the Clean Power Plan? [https://www.nrdc.org/stories/how-clean-power-plan-works-andwhy-it-matters?gclid=EAIaIqobChMI\\_oHZxuTG2QIVxh-GCh07ownIEAAYASAAEgKq2vD\\_Bw](https://www.nrdc.org/stories/how-clean-power-plan-works-andwhy-it-matters?gclid=EAIaIqobChMI_oHZxuTG2QIVxh-GCh07ownIEAAYASAAEgKq2vD_Bw)

<sup>2</sup> Executive order rolls back clean power plan. (2017). *Mining Engineering*, 69(5), 8. <http://ezproxy.lib.uconn.edu/login?url=https://search.proquest.com/docview/1913287009?accountid=14518>

<sup>3</sup> Bump, P. (2017, August 23). Analysis | Trump's explanation of 'clean coal' was wrong - but not as wrong as it sounded. [https://www.washingtonpost.com/news/politics/wp/2017/08/23/trumps-explanation-of-clean-coal-was-wrong-but-not-as-wrong-as-it-sounded/?utm\\_term=.ec5c4e64169f](https://www.washingtonpost.com/news/politics/wp/2017/08/23/trumps-explanation-of-clean-coal-was-wrong-but-not-as-wrong-as-it-sounded/?utm_term=.ec5c4e64169f)

<sup>4</sup> Bump, P. (2017, July 10). Analysis | Why is Trump more worried about coal miners than department store employees? [https://www.washingtonpost.com/news/politics/wp/2017/07/10/why-is-trump-more-worried-about-coal-miners-than-department-store-employees/?utm\\_term=.4544a58ec7c8](https://www.washingtonpost.com/news/politics/wp/2017/07/10/why-is-trump-more-worried-about-coal-miners-than-department-store-employees/?utm_term=.4544a58ec7c8)

needs and our people deserve.”<sup>5</sup> Thus, he shamelessly requests the bipartisan views on coal be mainstreamed to one so that all Americans can have updated highways and parking lots. Yet perhaps more critically, it is unnerving the Trump Administration’s faith in fossil fuels does not end at improving infrastructure; it broadens as a larger priority in protecting energy security within the scope of the international energy economy. According to a recently published brochure by the U.S. Department of Energy’s Office of Fossil Fuels, “Fossil fuels are projected to remain the mainstay of energy consumption well into the 21st century. Availability of these fuels to provide clean, affordable energy is essential for ‘global prosperity and security.’”

When even the U.S. Department of Energy refers to coal and other carbon-based fuels as “clean,” we can speculate the extent of climate denialism taking place in the nation’s capital. It is likely President Trump, a businessman by trade, has been using the word “clean” as a marketing term, or business tool to make coal sound better than it is. Trump uses the term as if to suggest we will begin mining a new form of the mineral that does not release particulates harmful to human health or contribute to global levels of atmospheric greenhouse gas.<sup>6</sup> To push his alternative agenda forward, Trump is using oversimplified language to rationalize abandoning certain government regulations and easing the process for coal mines and refineries to obtain permits. As the infamous @realDonaldTrump Tweet regarding climate change by anthropogenic sources declares, “The concept of global warming was created by and for the Chinese in order to make U.S. manufacturing non-competitive.”<sup>7</sup>

Scientific ignorance aside, it is almost certain that the Trump Administration has strategically denied climate change by anthropogenic activity because it could potentially compromise our national security and economic competition with other dominant nations in the global energy economy, such as China and Russia. Climate change denialism has become so political that it is not surprising Trump is beginning to utilize obscure adjectives in order to push his real security objectives through. As former Deputy Director of the National Park Service Christy Goldfuss has asserted regarding Trump’s Clean Coal plan, “It’s a scam that will gut or significantly change at least 10 bedrock environmental laws to make it easier for corporations to bypass critical protections for air, water and wildlife.”<sup>8</sup>

Still, it is important to acknowledge what Trump actually means by “cleaning” coal, because there is some factual basis to the developmental technology he is referring to. Clean coal refers to the process by which coal is captured and stored after it is burned.<sup>9</sup> This process is substantiated by innovative technologies that the U.S. Department of Energy has only recently begun researching and developing. In fact, carbon capture and storage (CCS) is vastly

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<sup>5</sup> Kaufman, A. C., & D'Angelo, C. (2018, January 30). Trump Touts 'Beautiful, Clean Coal' And Fails To Link Disasters To Climate Change. [https://www.huffingtonpost.com/entry/trump-sotu-energy\\_us\\_5a6f6dd2e4b06e25326a7f13](https://www.huffingtonpost.com/entry/trump-sotu-energy_us_5a6f6dd2e4b06e25326a7f13)

<sup>6</sup> Bump, P. (2017, August 23). Analysis | Trump's explanation of 'clean coal' was wrong - but not as wrong as it sounded. [https://www.washingtonpost.com/news/politics/wp/2017/08/23/trumps-explanation-of-clean-coal-was-wrong-but-not-as-wrong-as-it-sounded/?utm\\_term=.ec5c4e64169f](https://www.washingtonpost.com/news/politics/wp/2017/08/23/trumps-explanation-of-clean-coal-was-wrong-but-not-as-wrong-as-it-sounded/?utm_term=.ec5c4e64169f)

<sup>7</sup> Jacobson, L. (2016, June 02). “Yes, Trump did say climate change was a Chinese hoax.” <http://www.politifact.com/truth-o-meter/statements/2016/jun/03/hillary-clinton/yes-donald-trump-did-call-climate-change-chinese-h/>

<sup>8</sup> Kaufman, A. C., & D'Angelo, C. (2018, January 31). Trump Touts 'Beautiful, Clean Coal' And Fails To Link Disasters To Climate Change. [https://www.huffingtonpost.com/entry/trump-sotu-energy\\_us\\_5a6f6dd2e4b06e25326a7f13](https://www.huffingtonpost.com/entry/trump-sotu-energy_us_5a6f6dd2e4b06e25326a7f13)

<sup>9</sup> Bump, P. (2017, August 23). Analysis | Trump's explanation of 'clean coal' was wrong - but not as wrong as it sounded. [https://www.washingtonpost.com/news/politics/wp/2017/08/23/trumps-explanation-of-clean-coal-was-wrong-but-not-as-wrong-as-it-sounded/?utm\\_term=.ec5c4e64169f](https://www.washingtonpost.com/news/politics/wp/2017/08/23/trumps-explanation-of-clean-coal-was-wrong-but-not-as-wrong-as-it-sounded/?utm_term=.ec5c4e64169f)

experimental, and has received little more than \$45 million in federal funding for research and development,<sup>10</sup> despite its role as a focal point in Trump's energy plan. Even if substantial development with CCS were to be made in the near future, there is still the environmental question of what will happen with the captured carbon. With CCS, the *entirety* of carbon pollutants and particulates are still emitted after burning carbon based fuels, and so it becomes clear the focus of "clean coal" is not to reduce carbon emissions. According to the U.S. Department of Energy Office of Fossil Fuels, energy policy will be enacted to allow geological storage for 600+ gigatons of CO<sub>2</sub>, which is supposedly enough capacity to hold several centuries' worth of U.S. power emissions.<sup>11</sup> Carbon capture is obviously more costly than burning coal without capturing emissions, and so it is up for debate whether this technology will actually come to fruition or not.

This alludes to the fundamental and dangerous implications of calling coal mining "clean." Besides its purpose to bring back a dying mining industry, it undermines legitimately clean and sustainable energy sources that do not rely on experimental projects to capture carbon emissions, because they don't produce any in the first place. The lost opportunity cost for research and development in sustainable energy sources such as solar, wind, and hydroelectric energy generation will stagnate long-term growth in America. Furthermore, increases in education will correlate negatively with a resurgence of jobs in manufacturing, drilling, and mining, whereas the demand for labor in high-tech renewable energy sectors will only continue to rise. According to the U.S. Mine Safety and Health Administration, the coal industry employed 127,745 people in 2008, and by 2015 that number dropped to 98,050.<sup>12</sup> Despite the promised recovery by Trump, the coal mining industry has lost tens of thousands of jobs since 2008 and it will be very difficult to recover those numbers.

Furthermore, the clean coal industry has a profound interest in denying climate change, and this denialism cannot last forever. 2017 was the second-hottest year on record — that worsened the natural disasters and catastrophic storms that killed 300 Americans and caused a record \$306 billion in damages.<sup>13</sup> Experts suggest that even a marginal increase in global temperature — as little as 1° Celsius — causes extreme climate change and volatile conditions for native organisms.<sup>14</sup> The cascade of environmental harms that could follow this potential change in climate should be a national security priority for the Trump Administration, yet it remains out of sight and out of mind.

The critical point that must be emphasized is that coal is not clean, and carbon capture projects may or may not yield effective results for mitigating emissions. Considering the other tactics

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<sup>10</sup> Department of Energy. (2018, February 16). Energy Department Invests \$44M in Advanced Carbon Capture Technologies Projects. <https://www.energy.gov/articles/energy-department-invests-44m-advanced-carbon-capture-technologies-projects>

<sup>11</sup> The U.S. Department of Energy's Office of Fossil Fuels . (2018). *Clean Coal Technology: From Research to Reality* [Brochure]. Author. Retrieved March 31, 2018.

<sup>12</sup> Executive order rolls back clean power plan. (2017). *Mining Engineering*, 69(5), 8.

<http://ezproxy.lib.uconn.edu/login?url=https://search.proquest.com/docview/1913287009?accountid=14518>

<sup>13</sup> Kaufman, A. C., & D'Angelo, C. (2018, January 30). Trump Touts 'Beautiful, Clean Coal' And Fails To Link Disasters To Climate Change. [https://www.huffingtonpost.com/entry/trump-sotu-energy\\_us\\_5a6f6dd2e4b06e25326a7f13](https://www.huffingtonpost.com/entry/trump-sotu-energy_us_5a6f6dd2e4b06e25326a7f13)

<sup>14</sup> Nuccitelli, D. (2016, September 19). New study undercuts favorite climate myth 'more CO<sub>2</sub> is good for plants' <https://www.theguardian.com/environment/climate-consensus-97-per-cent/2016/sep/19/new-study-undercuts-favorite-climate-myth-more-co2-is-good-for-plants>

Trump has used to advance his agenda, there is a strong possibility CCS projects may be no more than appeasement for the vast number of environmental activists opposing the President in both the public and private sectors. Whether or not Trump eventually embraces any facts counter to his plan, the protests for more renewable energy must not concede, and activism within the environmental community must continue to thrive. If the Trump Administration has explicitly stated they wish to revitalize the coal mining industry, then American citizens can explicitly say they will not support or purchase coal-based fuels. Consumers ultimately have a say in the durability of the coal market, regardless of what pro-coal policies are put in place or what bans are lifted to bypass conservation efforts.

Lastly, the time has come for local and state governments to pursue their own timetable of renewable energy policy implementation, and certain states have already laid out their objectives for their energy sector's future. In Connecticut alone, United States Senators Chris Murphy and Richard Blumenthal have expressed that Connecticut is a proud world leader of fuel cell production and will continue to pursue clean energy options.<sup>15</sup> The recognition of danger has lead many informed consumers and politicians to turn a corner on outdated fossil fuel production, and now the fight continues to reject the clean coal promise and pursue cleaner, more environmentally-viable patterns of development.

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<sup>15</sup> FuelCell Energy, Inc. (2018, February 21). Photo Release-U.S. Senator Blumenthal Expresses Industry Support in Visit to FuelCell Energy. <https://globenewswire.com/news-release/2018/02/21/1372996/0/en/Photo-Release-U-S-Senator-Blumenthal-Expresses-Industry-Support-in-Visit-to-FuelCell-Energy.html>

# The Battle for the Arctic: Russia, the United States and Geopolitics

By Darren Daughtry Jr.

It is well established that in the coming decades climate change will affect life across the globe. Climate change will amplify the strength of extreme weather events like hurricanes, droughts and snowstorms.<sup>16</sup> Warmer temperatures in the polar region will melt ice causing sea levels to rise and warmer temperatures will destroy wildlife habitat.<sup>17</sup> However, the melting of the Arctic ice caps poses new challenges in the realm of geopolitics. As ice melts, it will become easier for ships to navigate the Arctic Ocean. As such, it is important to acknowledge the Arctic Ocean is home to an estimated quarter to one third of the world's undiscovered oil and natural gas reserves. This total is more than the total hydrocarbon reserves in Saudi Arabia.<sup>18</sup> These resources have been noticed by nations with territory in the Arctic, especially Russia. In recent years, Russia has devoted massive resources to aggressively remilitarizing the Arctic Ocean, catching the U.S. and the European Union off guard.

While most people see the melting of the Arctic ice caps as an environmental tragedy, the Russians have mobilized to benefit from this situation. Ever since 2007, Russia has moved to establish its presence in the region. In August of that year, for example, a Russian mini sub placed a Russian flag at the bottom of the Arctic Seabed. This act reminded many of Colonial Era land grab.<sup>19</sup> It was largely symbolic and emphasized Russia's desire to claim the resources underneath the Arctic seafloor. Recently, Russia has reopened military bases in the Arctic region and continues to add to its fleet of icebreakers. Currently, Russia has about 38 icebreakers. Six of these are nuclear powered.

By contrast, the U.S. has two icebreakers there. Neither of these are nuclear powered, and are used for operations in both the Arctic and the Antarctic.<sup>20</sup> This reality looks even worse given the fact that Russia is building six more icebreakers, three of which are nuclear powered, and two of which will be armed with anti-ship missiles.<sup>21</sup> To date, the U.S. is not investing in any replacement icebreakers. This disparity in development underscores that the Russians have an advantage when operating in the Arctic. Overall, as the ice continues to melt the role, these icebreakers play will be extremely important in the region.

Russia is not only expanding its maritime presence in the Arctic: It is increasing its physical presence there, as well. In recent years, it has reopened several Soviet-era military facilities in Antarctica.<sup>22</sup> While the largest of these bases will be home to about 250 soldiers, these

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<sup>16</sup> Rapier, Robert. "The Role of Climate Change in Extreme Weather Events." *Forbes.com*. September 10th, 2017 2017.

<sup>17</sup> Glick, Daniel. "The Big Thaw." *National Geographic.com*. Web. <<https://www.nationalgeographic.com/environment/global-warming/big-thaw/>>

<sup>18</sup> Osborne, Andrew. "Putin's Russia in Biggest Arctic Military Push Since Soviet Falls." *Reuters.com*. January 30th 2017 2017. Web. <<https://www.reuters.com/article/us-russia-arctic-insight/putins-russia-in-biggest-arctic-military-push-since-soviet-fall-idUSKBN15E0W0>>

<sup>19</sup> Arfitt, Tom. "Russia Plants Flag on North Pole Seabed." *The Guardian.com*. August 2nd, 2007 2007. Web. <<https://www.theguardian.com/world/2007/aug/02/russia.arctic>>

<sup>20</sup> Osborne, Andrew. "Putin's Russia in Biggest Arctic Military Push Since Soviet Falls." *Reuters.com*. January 30th 2017 2017. Web. <<https://www.reuters.com/article/us-russia-arctic-insight/putins-russia-in-biggest-arctic-military-push-since-soviet-fall-idUSKBN15E0W0>>

<sup>21</sup> Ibid.

<sup>22</sup> Ibid

installations are outfitted with runways and anti-aircraft missiles, demonstrating that these facilities will be permanent. The U.S, on the other hand, only has one base in the Arctic, Air Force Base Thule, in Thule, Greenland.<sup>23</sup> Thule Air Force base lies several hundred miles north of the Arctic Circle, and is a little less than a thousand miles south of the North Pole. Thule Air Force Base is the home to an array of sensors and early warning missile technology.<sup>24</sup>

Besides this base, the U.S. military does not have a permanent presence in the Arctic. To compensate for this fact, the U.S. has sent troops to Norway for training, marking the first time since WWII foreign troops have been stationed there.<sup>25</sup> Furthermore, in May of 2017, the North Atlantic Treaty Organization (NATO) held military exercises in Finland, Norway, and Sweden.<sup>26</sup> While it will never compensate for the lack of a permanent U.S. presence in the Arctic, it does show that the U.S. is monitoring Russia's activities in Arctic.

While it is important to understand the more active role the U.S. and Russia play in the Arctic, it is also necessary to disentangle their rationale for doing so. In the case of the Arctic, the answer is oil and natural gas. The Arctic is home to an estimated 400 billion barrels of each, which is equal to a quarter to a third of the world's known reserves and exceeds all of Saudi Arabia's hydrocarbon resources.<sup>27</sup> As the Arctic sea ice continues to melt in the coming years and decades oil companies will try and access them. This is especially true for Russian oil and gas companies. Currently, in Russia many of these existing oil and natural gas wells are either peaking or declining.<sup>28</sup> This means that Russian oil companies need to find new locations to drill for oil and natural gas. In the coming years, they may set their sights on the Arctic. Similarly, American oil and fossil fuel companies have been tempted to attempt to drill for oil and natural gas in the Arctic region. Shell, in particular, has been active in trying to drill for oil here.<sup>29</sup>

However, such efforts have ended in disaster. In 2012, one of Shell's drilling platforms ran aground on its way to the waters of coast of Northern Alaska.<sup>30</sup> Later that year, the same drilling rig had to abandon operations due to an ice flow that was nearing the rig. As if things could not have gotten any worse, the rig caught on fire while it was being towed away.<sup>31</sup> Another of Shell's drilling rigs did not fare much better: While it was being towed to Seattle, winter high winds and rough seas caused the tow rope to snap and the rig to run aground. While the American oil companies have been tempted to drill for oil in the Arctic, the difficult experiences of Shell have dissuaded many from doing so. For the U.S. itself, this reality is not an economic

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<sup>23</sup> "Alaska Military Bases." *militarybases.com*. Web. <<https://militarybases.com/alaska/>, and "Arctic Air Base Gets \$40 million Upgrade in the Face of Increasing Missile Threats." *cbsnews.com*. May 30th 2017. Web. <<https://www.cbsnews.com/news/inside-thule-air-base-arctic-jeff-glor/>

<sup>24</sup> "Arctic Air Base Gets \$40 million Upgrade in the Face of Increasing Missile Threats." *cbsnews.com*. May 30th 2017. Web. <<https://www.cbsnews.com/news/inside-thule-air-base-arctic-jeff-glor/>

<sup>25</sup> Maxey, Levi. "The Kremlin and U.S. Circle Each Other in Warming Arctic." *The Cipherbrief.com*. January 28th, 2018. Web. <<https://www.thecipherbrief.com/kremlin-u-s-circle-warming-arctic>

<sup>26</sup> Ibid.

<sup>27</sup> Osborne, Andrew. "Putin's Russia in Biggest Arctic Military Push Since Soviet Falls." *Reuters.com*. January 30th 2017. Web.

<sup>28</sup> Ibid.

<sup>29</sup> Plumer, Brad. "The Controversy Over Shell's Arctic Oil Drilling Explained." *Vox.com*. September 2nd 2015. Web. <<https://www.vox.com/2015/9/2/9248593/shell-arctic-drilling-obama>

<sup>30</sup> Ibid.

<sup>31</sup> Ibid.

problem, because it gets most of its oil and natural gas from the Gulf of Mexico and Canada.<sup>32</sup> It is nonetheless a geopolitical and environmental issue as nations attempt to curb climate change.

The melting of the Arctic ice is one of the many effects of climate change. This thawing of the ice has created the prospect of drilling for oil and natural gas a reality in the region. As the ice continues to liquefy, accessing these resources will become feasible for nations, increasing the likelihood that both corporations and governments will claim the vast resources said to be located there. Driven largely by a need to find deposits of oil and natural gas, Russia has implemented measures to establish itself as a player in the Arctic for the foreseeable future. The U.S. has been slow to establish a similar presence in the Arctic, giving the Russians advantage in the region, for the time being. While the U.S. will most likely militarize its part of the Arctic in a similar manner as the Russians, it should invest heavily in building new icebreakers. This will allow the U.S. to expand its capabilities in the Arctic and be a key player in the region in the coming decades.

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<sup>32</sup> Flintoff, Corey. *npr.com*. April 12th 2012 2012. Web. <<https://www.npr.org/2012/04/11/150444802/where-does-america-get-oil-you-may-be-surprised>

# Climate Change and Refugees: The Environment as a Threat to National Identity

By Lucas Bladen

The dawn of the anthropocene, in which human activity has heavily influenced the Earth's geological and environmental phenomena, is more than a point of scientific curiosity. Rather, it has the potential to upend current understandings of borders, nation-states, and international institutions. As Gill (2010) notes, the modern, Western conception of government depends on a "Westphalian" framework, wherein a centralized government takes charge over a fixed set of citizens with a specific national identity.<sup>33</sup> Due to technological advances, globalization has begun to challenge this paradigm, particularly as it relates to refugees. Migration has always been at least partly contrary to the principle of the Westphalian nation-state, and refugees, because of their status as stateless people requiring international assistance, are especially unique.<sup>34</sup> Furthermore, the newer subcategory of "climate refugees" provides a political dilemma: can climate change provide a basis for "well-founded fear" as described in the 1967 Protocol relating to the Status of Refugees? Additionally, it is worth considering how climate changes may impact ways of responding to refugee crises; the resulting need for increased international cooperation may challenge the role of individual nation-states even more.

Since the end of the Second World War, international institutions have seen the rise of increasingly interdependent states that are linked by economic, political, military, and humanitarian ties. Organizations such as the United Nations (UN) and, most markedly, the European Union (EU) have created a debate regarding the extent to which individual states maintain their national sovereignty.<sup>35</sup> That said, it is undoubtedly still national governments that exercise the most authority, even in the face of global political problems such as refugee crises. One must keep in mind that one of the greatest political divisions in response to the European migration crisis, for example, has concerned the amount of international cooperation needed to maintain stability in member states.

That said, such political squabbles would be much less morally permissible in the context of pressing environmental concerns. Refugee crises have traditionally been defined as impacting a "country of origin" and at least one "host country," a dichotomy responsible for the notion that the policy decisions of the former state are responsible for creating the displacement of its citizens. While this can be true in situations of armed conflict, such a claim may be doubtful in relation to climate change.<sup>36</sup> Environmental phenomena are not cognizant of international borders or state sovereignty, and they do not take into account existing power dynamics. The wealthy Western states most able to refuse displaced persons are the same ones least likely to suffer from climate change. However, how will these nations react when the impact of their

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<sup>33</sup> Gill, Nick. "New State-Theoretic Approaches to Asylum and Refugee Geographies." *Progress in Human Geography*, vol. 34, no. 5, 2010, pp. 626-645.

<sup>34</sup> Zetter, R. (2007). More Labels, Fewer Refugees: Remaking the Refugee Label in an Era of Globalization. *Journal of Refugee Studies*, 20(2), 172-192.

<sup>35</sup> Lansford, T. (2000). Post-Westphalian Europe? Sovereignty and the Modern Nation-State. *International Studies*, 37(1), 1-15.

<sup>36</sup> McKee, Y. (2011). On Climate Refugees : Biopolitics, Aesthetics, and Critical Climate Change. *Qui Parle: Critical Humanities and Social Sciences*, 19(2), 309-325.

heavy carbon footprints wreak havoc on vulnerable states such as Maldives and Tuvalu, among countless others? Numerous small island nations are “existentially threatened” by climate change through little to no fault of their own.<sup>37</sup> The question of which individual states (if any) are responsible for assisting those hurt most by a shifting environment is particularly salient in the context of climate refugees. Given the difficulty of separating the impact of one state from another, stronger international cooperation may be the only way to ensure accountability.

Much of the theory that serves at the core of political science depends on the assumption that nation-states are the default unit of modern human society.<sup>38</sup> However, today’s political environment has called the validity of this supposition into question, as both international governmental institutions and nationalist sentiment have gained power. Some theorists argue that that cities will become more influential in future geopolitical politics, citing the supposed failure of nation-states to face certain conflicts, such as climate change.<sup>39</sup> Given the frequent proximity of urban areas to bodies of water, cities have been at the forefront of the fights for sustainable development and renewable energies.<sup>40</sup> Urban alliances through organizations like the C40 Climate Leadership Group (C40) and the Global Covenant of Mayors for Climate and Energy have challenged the narrative that nation-states are always dominant in policy debates. On a more global scale, the United Nations Framework Convention on Climate Change, which was responsible for drafting the 2015 Paris climate accord, has kept pressure on nation-states lagging behind on climate policy. Given these local and international pressures, individual countries have shown that they no longer hold on a monopoly on responses to climate change.

This disconnect, however, is problematic as it relates to climate refugees. Researchers estimate that since 2009, individuals have been displaced by natural disasters at a rate of one person per second.<sup>41</sup> Modern waves of displaced persons have challenged historical definitions of and frameworks for protecting refugees, with humanitarian organizations struggling to respond appropriately to unprecedented crises. The international conventions governing the basic tenets of refugee policy take for granted that human displacement is a result of violent conflict or persecution; there is no discussion of climate-based forced migration. The 1951 Convention Relating to the Status of Refugees and its 1967 Protocol still take a “well-founded fear” of persecution as the cornerstone of the definition of a “refugee,” after all.<sup>42</sup>

Within these documents, discussion focuses primarily on the role of nation-states in responding to refugee crises. Such a framework has come to imply that refugees, having been persecuted by their “country of origin,” flee to neighboring states, otherwise known as “host countries.” The paradigm is appropriate when either interstate or intrastate disputes are at the root of a refugee

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<sup>37</sup> Wyman, K. (2013). Are We Morally Obligated to Assist Climate Change Migrants? *The Law & Ethics of Human Rights*, 7(2), 185-212.

<sup>38</sup> Nation-State. (n.d.). Retrieved April 28, 2018, from <http://www.unesco.org/new/en/social-and-human-sciences/themes/international-migration/glossary/nation-state/>

<sup>39</sup> Muggah, R., Sargent, R., Nourbakhsh, I., Dille, P., Igarapé Institute, Carnegie Mellon University, & Robotics Institute. (2017, June 2). Cities, not nation states, will determine our future survival. Here’s why. Retrieved April 28, 2018, from <https://www.weforum.org/agenda/2017/06/as-nation-states-falter-cities-are-stepping-up/>

<sup>40</sup> C40 Cities: Why Cities? Ending Climate Change Begins in the City. (2012). Retrieved April 28, 2018, from <http://www.c40.org/ending-climate-change-begins-in-the-city>

<sup>41</sup> Sánchez, D. (2015, January 1). Climate Change and Disasters. Retrieved from <http://www.unhcr.org/en-us/climate-change-and-disasters.html>

<sup>42</sup> Convention and Protocol Relating to the Status of Refugees. Retrieved from <http://www.unhcr.org/en-us/protection/basic/3b66c2aa10/convention-protocol-relating-status-refugees.html>

crisis, but what about environmental disasters? Does forced migration due to environmental causes still mean that a “refugee” classification is warranted, even if such terms as “persecution” do not seem to be applicable? Can one be considered an internally displaced person (IDP) or refugee when his or her host country fails to provide relief from an environmental crisis, even if there has been no formal loss of citizenship? Individuals can undoubtedly have a well-founded fear of an impending climate-based disaster, even if their home country is not technically guilty of human rights violations. Some scholars completely reject the modern notion of climate refugees, claiming that such a category is not rooted in international human rights law, and relies instead on a distortion of an otherwise clearly defined concept.<sup>43</sup>

Rather than get lost in the spiraling debate surrounding the appropriateness of the “climate refugee” classification, this article chooses to focus on the policy implications of aiding individuals affected by environmental forced migration. If the details of this discussion seem pedantic, it is important to consider the pressing nature of climate change as it relates to refugees; since the dawn of the 21st century, environmental catastrophes have forced mass movements of people out of such diverse countries as Maldives, Kiribati, Haiti, Honduras, Mexico, and Nicaragua, to name only a few.<sup>44</sup> Rising temperatures sea levels across the world have the potentially to drastically increase the number of nations affected by climate-based forced migration, and yet current national and international policies will be unequipped to handle future crises.

Existing refugee conventions serve largely to dictate which nation-states are responsible for responding to refugee crises. This framework is useless, however, when phenomena indifferent to national borders (e.g. climate change) are at play; it thus becomes more difficult to establish which countries are implicated in subsequent refugee policy. Part of the problem lies in the fact that political actions, unlike environmental ones, are easy to trace, from their conception to their conclusion. This dichotomy is acceptable when it is the actions of a defined set of nation-states at the heart of a refugee crisis; on the other hand, an occurrence as far-reaching as climate change makes it difficult to establish which countries should be involved in burden-sharing.<sup>45</sup> Similarly, climate refugees face different obstacles than other classifications of forced migrants, especially in terms of their long-term obstacles. Voluntary repatriation, for example, may be impossible if rising sea levels, desertification, or increasingly volatile environments make refugees’ countries or regions of origin uninhabitable. Local integration into nearby states may be problematic if they, too, are subject to the same environmental pressures; even today, the Sudanese refugee camp in Bonga, Ethiopia, has faced rising tensions with surrounding communities due to environmental shifts.<sup>46</sup> Climate change has created competition for resources across the world, and it would be unwise to implicate already-vulnerable refugees in such conflicts. Lastly, third-

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<sup>43</sup> Gemenne, François. “One Good Reason to Speak of ‘Climate Refugees.’” 2015, pp. One good reason to speak of ‘climate refugees.’ Forced Migration Review, 49, 70–71. Oxford, United Kingdom Refugee Studies Programme. (2015).

<sup>44</sup> Swift, J. (2017, September 13). Migration, Forced by Climate Change. Retrieved April 28, 2018, from <https://research.cornell.edu/news-features/migration-forced-climate-change>

<sup>45</sup> Biermann, Frank, and Boas, Ingrid. “Preparing for a Warmer World: Towards a Global Governance System to Protect Climate Refugees.” *Global Environmental Politics*, vol. 10, no. 1, 2010, pp. 60–88.

<sup>46</sup> Martin, Adrian. “Environmental Conflict Between Refugee and Host Communities.” *Journal of Peace Research*, vol. 42, no. 3, 2005, pp. 329–346.

country resettlement (i.e. the placement of refugees in a more developed state), because of its high cost, does not have the potential to assist more than a handful of refugees.

Gaps in existing refugee policy are problematic because they are rooted in the basic tenets of international human rights law. Given that nation-states have historically been understood as the primary upholders of humanitarian obligations towards refugees, it is concerning to claim, as I have done here, that individual countries are ineffective in responding to climate-based forced migration. Despite the existence of international covenants theoretically governing the basic elements of refugee policy, the degree of autonomy and discretion nation-states still hold within this process has prevented a lack of international coordination and cooperation. More effective aid to climate refugees would require countries to participate more fully in relevant international programs, such as the United Nations Environmental Programme (UNEP), United Nations Development Programme (UNDP), the World Food Programme (WFP), and the United Nations High Commissioner for Refugees (UNHCR). As with any international institution, these programs have little in the way of enforcement power, meaning that a truly global response to climate-based forced migration is unlikely to be created under what is still the relatively decentralized political framework of today.

# A Symbol of American Values: The Coal Industry in the Age of Trump

By Christian Krog

Regardless of lackluster public opinion for President Donald Trump, it is clear that his campaign slogan, “Make America Great Again,” is potentially the greatest motto to ever be pioneered by a U.S. President. Why? If you break down the saying, it simply means that the United States fundamentally is a great and wonderful place, yet due to some kind of interference, has lost its way. It signals, too, that President Trump is somehow the only one who can bring the nation back to its glory. Among other demographics, some of Trump’s most notorious following consists of white working class people, who feel that the government has had a hand in their misfortune and that government interference has decreased their overall quality of life.<sup>47</sup>

The coal industry then represents classic American capitalistic ideals. The coal miner is an example of a dedicated, blue-collar worker who, through hard work, provides for his family.<sup>48</sup> The Republican Party, spearheaded by President Trump, hopes to bring the coal industry back, as well, signaling and enforcing conservative interpretations of the American ideals of individual hard work and perseverance, rather than on the economic, social and environmental welfare of society as a whole. Given that some Americans may yearn for romanticized periods during American history where those who practiced strict, conservative values were able to succeed more so than they are in modernity, President Trump harped on this sentiment by directly associating coal jobs with a necessity to make America great once again. For example, the President profits off the idea that revitalizing coal will improve people’s quality of life — a nostalgic idea of an American industry providing good-paying, middle class jobs to workers and their families.

In reality, though, the coal industry is dead, lackluster, economically unsound, and catastrophic for the environment, and the administration’s portrayal of coal is done without any analysis into the realities of the current atmosphere of industry. These are the facts: Today, coal production within the United States is currently at its lowest level since 1978.<sup>49</sup> The industry has been in decline for decades, which has caused a loss of over 100,000 coal jobs over the last two decades alone.<sup>50</sup> Currently, in the United States, there are only about 50,000 coal workers, and most reside in Pennsylvania, West Virginia, and Wyoming. These workers themselves are struggling, finding their families and their communities falling into economic insecurity as the mines that fuel their economy cease to be profitable in the 21<sup>st</sup> Century. Entire districts relying on the industry have higher than average rates of unemployment, similar to Detroit and economic measures associated with the auto-industry and bankruptcy. According to a study published by Columbia University’s Center on Global Energy Policy, even if President Trump repeals all environmental regulations over coal, coal jobs will continue to dissipate.<sup>51</sup> The efforts of

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<sup>47</sup> "Make Coal Great Again". 2017. Envisioning The American Dream. Accessed April 18 2018. <https://envisioningtheamericandream.com/2017/04/03/make-coal-great-again/>.

<sup>48</sup> 2018. Gop.Com. Accessed April 18 2018. <https://gop.com/blue-collar-workers-rebound-under-trump-rsr/>.

<sup>49</sup> 2017. Eia.Gov. Accessed March 3 2018. <https://www.eia.gov/todayinenergy/detail.php?id=29472>.

<sup>50</sup> "Even Coal Country Knows Trump Can't Save It". 2018. Quartz. Accessed March 5 2018. <https://qz.com/1191785/even-coal-country-knows-trump-cant-save-it/>.

<sup>51</sup> Houser, Trevor, Bordoff, Jason, Marsters, Peter. "Can Coal Make A Comeback?" Columbia Center on Global Energy Policy (2017).

President Trump then to revive the coal industry are fruitless, riddled with ulterior political motives, and provide struggling coal workers with nothing except false promises.

It is important not only to acknowledge the bleak future of coal but also its dangerous effects. Despite ongoing partisan debates in Washington, nearly all scientists maintain that climate change is caused by human activities, such as burning fossil fuels like coal. According to the Union of Concerned Scientists, coal produces four grams of carbon dioxide for every one gram of coal burned.<sup>52</sup> Coal is responsible then for 10% of all methane emissions, and methane as a greenhouse gas is 34 times more effective at trapping heat from naturally passing through the atmosphere.<sup>53</sup> Coal is also responsible for the majority of poisonous mercury emissions into the atmosphere.<sup>54</sup> This decrease in air quality due to coal causes more intense asthma, cancer, as well as heart and lung diseases.<sup>55</sup>

Considering the problematic and dangerous effects of air pollution, coal is also responsible for exacerbating poverty and insecurity in mining communities. West Virginia, a coal-producing giant, has a population in which only 19% of their adult population holds degrees beyond a high school diploma, far below the national average.<sup>56</sup> When the well-paying coal related jobs leave a community, there is a sudden influx of newly unemployed and uneducated workers who will have trouble finding new occupational opportunities. In response, West Virginia University is pioneering to promote higher education, entrepreneurship, and is singlehandedly working to attract big tech business and fill the void that coal has left in the state. The initiative was inspired by initiatives from the City of Pittsburgh, which after the decline in steel production, relied on local universities to jumpstart and boost its economic growth.<sup>57</sup> These initiatives are examples of how coal-reliant communities can transition and become more lucrative, healthy, and sustainable economies.

The United States has been reliant on coal since the Industrial Revolution, because it is an extremely versatile and cost-effective fuel source. However, due to advances in cost-effective alternative power sources such as hydroelectric, wind, and solar energy, coal's reign as one of America's favorite energy sources has concluded.<sup>58</sup> Ironically, a recent Department of Energy report details that the economic advantage of natural gas-based generation is the main cause of the impending closing of coal-based power plants, which contradicts the President's claims.<sup>59</sup> Technological advantages in natural gas technology have left coal an unprofitable business venture. It has only been within the past decade that coal has become more expensive to process

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<sup>52</sup> "Coal And Air Pollution". 2018. Union Of Concerned Scientists. Accessed March 6 2018. <https://www.ucsusa.org/clean-energy/coal-and-other-fossil-fuels/coal-air-pollution#.Wp4UGujwbIU>.

<sup>53</sup> Pirrone, Nicola, Sergio Cinnirella, Xinbin Feng, Robert B. Finkelman, Hans R. Friedli, Joy Leaner, Rob Mason et al. "Global mercury emissions to the atmosphere from anthropogenic and natural sources." *Atmospheric Chemistry and Physics* 10, no. 13 (2010): 5951-5964.

<sup>54</sup> Ibid.

<sup>55</sup> Ibid.

<sup>56</sup> "Can West Virginia University Jump-Start A New Economy Based On Innovation—Not Coal?". 2016. Fast Company. Accessed March 6 2018. <https://www.fastcompany.com/3065771/can-west-virginia-university-jump-start-a-new-economy-based-on-innovation-not-coal>.

<sup>57</sup> Ibid.

<sup>58</sup> Herzog, Katie, Justine Calma, Nathanael Johnson, Kate Yoder, Zoya Teirstein, Justine Calma, Zoya Teirstein, Zoya Teirstein, Nathanael Johnson, and Zoya Teirstein. 2016. "Donald Trump Promises To Revive The Coal Industry."

<sup>59</sup> U.S. Department of Energy, "Staff Report to the Secretary on Electricity Markets and Reliability," <https://www.energy.gov/staff-report-secretary-electricity-markets-and-reliability> (accessed March 3, 2018).

than natural gas and wind power, since natural gas constitutes a bigger source of energy production than coal for the United States and has done so while continually decreasing in cost. In 2014 one million British Thermal Units (BTU) cost \$5 million and then soon decreased to \$2.78 million in 2016.<sup>60</sup> In effectively being able to cut its' cost in half, natural gas has edged out coal as being a more reliable and economical choice for American consumption.<sup>61</sup>

Coal is bad for people's health, the economy, and the environmental longevity of the United States. The effects of climate change and air pollution coupled with the lack of any potential profit has proven to dismiss any claim for coal to return to the essential energy source it once was. When President Trump spoke to those affected by the failing coal industry, he attempted to spark hope in a sector of the working class who felt helpless. However, even with the full efforts of the President of the United States, the industry will not recover in the foreseeable future.

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<sup>60</sup> Ibid.

<sup>61</sup> Perry, M. (2017). The Real Cause of Coal's Collapse. [online] U.S. News. Available at: <https://www.usnews.com/opinion/economic-intelligence/articles/2017-03-09/abundant-cheap-natural-gas-is-the-real-reason-for-the-demise-of-coal> [Accessed 6 Mar. 2018].

# **A Threat to International Security: Climate Change's Environmental and Political Implications for Nations**

By Jessica Kirchner

In 2011, wheat-bearing regions in China were hit by a historical drought, knocking production levels down to record lows.<sup>62</sup> As a result, global wheat prices skyrocketed, and created intense pressure in the world's largest wheat importer: Egypt.<sup>63</sup> In 2011, as China was facing record drought, Egypt was feeling the bubbling of the Arab Spring, as local tensions and frustrations eroded the social construct. While the reasons for their anger were complex, a significant factor in their desperation was simple: They were unable to buy bread for their family.<sup>64</sup> As China's drought bottomed out the global supply of wheat, Egyptians were feeling the ramifications back at home, which exacerbated the tensions that eventually drove the country into anarchy.

The connection between Chinese drought and the Egyptian revolution highlights the ramifications of a single climate event and the consequences it can have on global security. This paper aims to evaluate the link between climate change and security through the lens of U.S. security policy. It begins with a summary of current U.S. security strategy, as outlined in the National Security Strategy (released in late 2017) and the National Defense Strategy (released in January 2018).<sup>65</sup> It then examines how security vulnerabilities are exacerbated by climate change, citing the impacts of mass migration as a threat multiplier. The paper relates the concern of mass migration back to the long-term security goals outlined by the NDS and NSS. These concerns are supported by historical examples, primarily the dynamics leading up to the Arab Spring.

The American lens on international security is shifting, as the spotlight moves away from conflicts with non-state actors (like Al-Qaeda and ISIL) to the long-term balance of power among global giants. This deviation is clearly seen in the newest National Defense Strategy, produced by the Department of Defense, which was championed by Secretary of Defense James Mattis in mid-January 2018.<sup>66</sup> While there remains a commitment to containing the chaos in the Middle East, the impending theaters of significance are the Asia-Pacific and Europe. According to the Brookings Institute, the Mattis strategy hinges on preparing for the war of tomorrow, rather than targeting small-scale conflicts today.<sup>67</sup>

However, the U.S. may be ignoring a key component of long-term security: The influence of climate change. Secretary Mattis unveiled the NDS in January, but a few months earlier, President Trump published his administration's National Security Strategy.<sup>68</sup> The theme of great power competition was paralleled in the NSS, but the topic of climate change as a security threat was noticeably absent. The topic was first added to the NSS in 2015 by the Obama

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<sup>62</sup> Sternberg, Troy. "Chinese Drought, Wheat, and the Egyptian Uprising: How a Localized Hazard Became Globalized."

<sup>63</sup> Ibid.

<sup>64</sup> Ibid.

<sup>65</sup> "Trump Removes Climate Change as Threat to U.S. in New Security Strategy." *Yale E360*, Yale School of Forestry and Environmental Studies

<sup>66</sup> Karlin, Mara. "How to Read the 2018 National Defense Strategy."

<sup>67</sup> Ibid.

<sup>68</sup> Butera, Candace. "Here Are All the Ways Climate Change Presents a Threat to National Security." *Pacific Standard*

administration.<sup>69</sup> President Trump's omission of climate change indicates an administration-wide attitude, but the refusal to recognize the validity of climate change as a whole, much less as a threat to national security, may be antithetical to the United States' long-term security goals, particularly in terms of a great power competition.

According to the Center for Climate Security, climate change is a "threat multiplier," meaning that it has the power to exacerbate tensions and worsen existing political and economic problems.<sup>70</sup> One component of this multiplier quality is the consequence of mass migration. As the world temperature rises, severe climate events like heat waves, droughts, and floods increase in frequency.<sup>71</sup> These events do the most damage to agriculture-based economies and low-lying islands, which are usually rural and impoverished communities.<sup>72</sup> As their livelihoods collapse, these areas become displaced and often migrate en masse to cities, which can add fuel to the fire of existing tensions.

This first consequence of mass migration on security is exemplified by the shifting dynamic seen in Syria from 2006-2011.<sup>73</sup> During this time, Syria experienced a long-term drought, which caused a severe bout of crop failures, affecting nearly 75% of farmers and herders.<sup>74</sup> As a result, there was a mass exodus to urban areas, which amounted to high rates of overpopulation, and aggravated the rising anti-government sentiment.<sup>75</sup> Seven years later, it is clear that the chaos in Syria spilled out onto the global stage, and had a major impact on regional stability. While the droughts brought on by climate change certainly were not the sole cause of the Syrian uprising, they acted like gasoline on a burning fire. This is the "threat multiplier" aspect of mass migration, and climate change as a whole.

Unprecedented levels of mass migration are predicted during the next century, as countries experience critical weather events.<sup>76</sup> According to The Center for Climate Security, food scarcity, food prices, and access to water will become pressing issues for nations in the Middle East and North Africa, which will cause mass migration to already unstable urban centers.<sup>77</sup> Nations that lie close to or just below sea level are at the most risk. For example, the Center for Climate Security predicts that more than 50 million Bangladeshis will be displaced due to climate change by 2050, and that other nations in the Asia Pacific will fair just as poorly.<sup>78</sup> As seen in Syria, large numbers of displaced people have the power jeopardize not just regional security, but international security as well. Much of the mass migration will occur in regions where the United States has vested interests, like the Middle East, and it is likely that countries may not be prepared for the impending threat.

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<sup>69</sup> Ibid.

<sup>70</sup> Slaughter, Anne Marie. "Preface." *The Arab Spring and Climate Change: A Climate and Security Correlations Series*

<sup>71</sup> Fernandez, Hannah. "Climate Change Will Force Mass Migration of 1 Billion by 2100."

<sup>72</sup> Sternberg, Troy. "Chinese Drought, Wheat, and the Egyptian Uprising: How a Localized Hazard Became Globalized."

<sup>73</sup> Femia, Francesco, and Caitlin Werrell. "Climate Change Before and After the Arab Awakening: The Cases of Syria and Libya."

<sup>74</sup> Ibid.

<sup>75</sup> Slaughter, Anne Marie. "Preface." *The Arab Spring and Climate Change: A Climate and Security Correlations Series*

<sup>76</sup> Parthemore, Christine, et al. "Working Group on Climate, Nuclear, and Security Analysis."

<sup>77</sup> Ibid.

<sup>78</sup> Ibid.

As the global temperature continues to rise annually, climate change threatens to cause extraordinary levels of mass migration, which poses a serious threat to U.S. national security. When mass migration acts as a “threat multiplier,” it endangers the national security goals outlined in the National Defense Strategy and the National Security Strategy. The Trump administration’s choice to ignore the effects of climate change on national security is one that has lasting ramifications, and it will likely leave the United States drastically unprepared for the “War of Tomorrow.”

# Rivers: The Fuel of International Growth and Conflict

By Nicholas LaBranche

Since the beginning of civilization some 12,000 years ago, rivers have been the corner stone of prosperity. From their fertile banks, cities and agriculture boomed, bringing forth the first great cities and empires of human civilization. Eventually, human beings mastered navigation and water voyage, allowing these waterways to serve as the ancient world's highway, as goods moved along their banks from city to city and place to place. Next, societies learned how to use the natural flow of the rivers for power, taking the basic idea of water wheels and forming hydroelectric dams that could power to thousands of homes.

Today rivers are used to fuel economic growth through agriculture, transportation, and power, as nations use this natural endowment, combining it with modern technology, to achieve growth and surplus beyond natural means. However, as with all resources, conflicts over who controls the waterways have become more frequent as populations and economies continue to grow, increasing all countries' needs to harness this resource. This form of environmental conflict, the control of rivers, will only continue to worsen as populations and economies continue to grow, increasing strain on the waterways as the 21<sup>st</sup> progresses into the 22<sup>nd</sup>. By exploring current conflicts, like that of the Grand Ethiopian Renaissance Dam and the Indus River Valley in Kashmir, we see how countries have responded to the growing demands of water resources and the interstate conflicts that have or might emerge from them. Hopefully, by gaining an understanding of this conflicts, we will create a blueprint to help solve one of the most intractable environmental conflicts of today.

Before we dive into the conflicts themselves, and possible solutions, we must first take a step back and ask a fundamental question: Who owns a river? Typically, it is understood that the waterways within a country's borders is under its sovereignty. However, when dealing with competing actors, there is typically one upstream and one downstream state. The upstream state has the ability to restrict water flow and control the origin point of the river. If, for example, they decide to dam the river, thus restricting water flow downstream, they are controlling the whole waterway. Globally, this question has never been answered as there are 0 internationally-binding treaties that clarify right to river ownership.<sup>79</sup> Attempts have been made to create guidelines and recommendations for states that share rivers, like the 1911 Madrid Declaration, which recommended only for countries "to abstain from unilateral alterations of river flow and to create joint water commissions."<sup>80</sup>

The few treaties that do exist today are typically between specific actors and often date back to colonial times. For example, the 1929 and 1959 Nile treaties were crafted by England, "which give all the water to downstream Egypt and Sudan and none to the eight upstream nations."<sup>81</sup> In 2010, this treaty was disavowed by upstream nations. A subsequent treaty was created, but Egypt

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<sup>80</sup> <http://www.waterunites-ca.org/themes/40-who-owns-the-water-international-law-and-transboundary-waters.html>

<sup>81</sup> [https://e360.yale.edu/features/a\\_global\\_treaty\\_on\\_rivers\\_key\\_to\\_true\\_water\\_security](https://e360.yale.edu/features/a_global_treaty_on_rivers_key_to_true_water_security)

and Sudan have claimed they hold veto power over any upstream construction projects.<sup>82</sup> The lack of a binding international treaty has left countries to act unilaterally, without any repercussions for depriving downstream countries of their natural rights to the river. So, the answer to the original question is simply that everyone and no one owns the rivers.

The first case study on this issue is the contention between Egypt, Sudan and Ethiopia over the Grand Ethiopian Renaissance Dam (GERD), being built on the Blue Nile. In 2011, Ethiopia announced plans to construct a hydroelectric dam on the Blue Nile, a vital tributary, which supplies 70% of the main flow of the Nile. The dam is expected to provide 5000mw of electricity to Ethiopia and create a massive reservoir of 74 billion cubic meters of water, which is equivalent to 40% of Egypt's Nile water supply.<sup>83</sup> For Egypt, it remains vital for crop irrigation and movement that the water supply remain unhindered and constant. Initial estimates on the effect of the GERD on stream flow have found that there is expected to be a reduction in stream flow to Lake Nasser, a vital water source of Sudan and Egypt, by 5%.<sup>84</sup>

In addition to a reduction in stream flow, the GERD is expected to trap vital sediment that is needed to restore the fertility of the flood plains of the Nile downstream.<sup>85</sup> The concerns of Egypt are confounded by the current water strain the countries face. With population in Egypt expecting to increase by 20 million by 2025, and water consumption expected to increase by 20% by 2020, it remains vital to Egypt's security that current water flows are not hindered.<sup>86</sup> Growing water scarcity, and the prospects of the GERD further exacerbating that problem, has led the Egyptian President to state, "The only matter that could take Egypt to war again is water."<sup>87</sup> National pride and national survival are on the line for all of the countries mentioned, as the needs of growing economies and growing populations must be met. War serves no parties best interest, and to avert such a catastrophe requires good-willed negotiations and compromise to ensure the right to water resources is guaranteed for all.

Another example highlighting this issue is the relationship between India and Pakistan, which is fraught, to put it lightly. Since the partition of these two countries, they have fought four wars and numerous skirmishes. Despite this fact, a 1960 water treaty, over the sharing of the Indus River, has remained intact through the conflict, even though India controls the upstream areas.<sup>88</sup> Under this agreement Pakistan has access to 80% of the water coming from the Indus River systems, which is vital to the country's agricultural sector.<sup>89</sup> Recently, India has seen economic explosion and, with it, has an ever-growing need for electricity. This growth has resulted in the proposed construction of numerous hydroelectric dams — the most controversial being the Kishanganga Dam, which is currently under construction. If completed, this dam would give India the capability to manipulate the water supply flowing into Pakistan.

The deep distrust between both nations has led to Indian officials not being forthcoming with information regarding the dam or the other dams under construction, increasing tensions and

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<sup>82</sup> <http://www.globalwaterforum.org/wp-content/uploads/2013/01/The-Grand-Ethiopian-Renaissance-Dam-and-the-Blue-Nile-Implications-for-transboundary-water-governance-GWF-13061.pdf>

<sup>83</sup> <https://www.tandfonline.com/doi/abs/10.1080/0163660X.2014.926207?journalCode=rwaq20>

<sup>84</sup> <https://ascelibrary.org/doi/pdf/10.1061/%28ASCE%29WR.1943-5452.0000520>

<sup>85</sup> <https://www.hydropower.org/case-studies/ethiopia-grand-ethiopian-renaissance-dam-gerd>

<sup>86</sup> <https://www.ecomena.org/egypt-water/>

<sup>87</sup> <https://www.wilsoncenter.org/sites/default/files/NavigatingPeaceIssuePKM.pdf>

<sup>88</sup> <https://thediplomat.com/2016/06/kashmir-a-water-war-in-the-making/>

<sup>89</sup> [http://www.nytimes.com/2010/07/21/world/asia/21kashmir.html?\\_r=1](http://www.nytimes.com/2010/07/21/world/asia/21kashmir.html?_r=1)

further increasing the cycle of secrecy. India nonetheless claims that water flow will continue, unembedded, and the current treaty will be upheld. The Pakistani response to this is best summed up by a quote from a prominent Pakistani lawyer on this issue: “It makes Pakistan very vulnerable... You can’t just tell us, ‘Hey you can trust us.’ We don’t. That’s why we have a treaty... Once you’ve had a gun put to your head and it’s been cocked, you don’t forget it.”<sup>90</sup> For a nation heavily reliant on the flow of this water to supply its large agricultural sector, these dams position India to be able to hold the waters hostage at any moment. That fact is only exacerbated by the effect of climate change, which is increasing glacial melting in the source regions and already reducing stream flow. It is crucial to point out here that the previous treaty has no clause for climate change. If stream flows reduce, India will still have to supply the previously agreed upon amount to Pakistan.<sup>91</sup> This opens up a possibility for conflict, as both sides will still need to meet their same water requirements while not having access to the same amount of water. Two nuclear nations are now facing ever-growing tensions in a region already experiencing extreme conflicts. If new agreements are not made and the diplomacy route not taken, this conflict has the possibility to escalate to war.

In both of these examples, we have seen that as economies and populations grow, the needs of nations increase. Rivers serve as a way that nations can harness the natural gifts of nature to help increase the livelihoods of their citizens. In both examples, we also saw the existence of antiquated treaties that no longer meet the reality of the days. While Egypt is synonymous with the Nile, it does not have the sole claim on this river and must find a way to balance geo-political relations and its own needs for the river. Pakistan and India both need the rivers for their own domestic economic needs, as well. War between these nations, over these rivers, has the possibility of turning both countries into ash via nuclear attacks. Cooperation combined with international pressure for supranational organizations, like the United Nations, can ease tensions between countries and force them to create lasting agreements, monitored and enforced by independent groups. Without cooperation, water strain felt by these countries will push them to act unproductively and toward a destructive path. While only citing two examples of this throughout the world, many other countries, too, are battling with neighbors over the right to water. Action must be taken by the world to solve the impending threats of a future water war.

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<sup>90</sup> [http://www.nytimes.com/2010/07/21/world/asia/21kashmir.html?\\_r=1](http://www.nytimes.com/2010/07/21/world/asia/21kashmir.html?_r=1)

<sup>91</sup> <https://thediplomat.com/2016/06/kashmir-a-water-war-in-the-making/>

# Treading on Thin Ice: Competition and Catastrophe in the Arctic

By: Shankara Narayanan

The Arctic is in trouble. As greenhouse emissions increase and temperatures rise, its ice sheets disappear. Ideally, they re-freeze during the winter, but the total area encompassed by ice floes is shrinking rapidly. In the past thirty years alone, the area of sea ice in the Arctic fell by over 50%.<sup>92</sup> And its volume? That plummeted by over 75% during the same time.<sup>93</sup> Needless to say, the crisis is intensifying. From rising sea levels to altered oceanic circulations, the Arctic's demise poses a serious threat to global environmental stability.

However, it also affects global security. Where once there was ice, there will be waterways and channels. Resources long thought to be unreachable reveal themselves with each thaw. Who gets to control them? Canada? The Norwegian states? Russia? Or perhaps the United States? Competition between the Arctic powers presents new challenges in foreign relations. International law formed decades ago is ill-equipped to deal with new realities. Clearly, it is time for a change. The receding ice sheets of the Arctic open new waterways through the North, requiring policymakers to re-evaluate international law to address new security concerns for the region, and for the world.

Arctic ice sheets recede, because of climate change and atmospheric imbalance. Polar regions covered in snow reflect sunlight, releasing more heat into the atmosphere than is absorbed. However, when dark blue water replaces bright white ice, that effect reverses. Those same regions take in more heat, leading to more melted ice, and more dark water. The cycle repeats itself, with more and more ice disappearing each year.<sup>94</sup> In fact, the six lowest levels of ice recorded via satellite imagery were captured from 2007-2012.<sup>95</sup> What does this mean? On the one hand, such recent reports demonstrate an environmental crisis. As ice melts, greater quantities of freshwater enter the ocean, affecting salinity levels while disrupting tides bearing warm surface waters.<sup>96</sup>

In short, the shrinking Arctic endangers global oceanic circulation. On the other hand, melting ice and regional dynamics create more *space*. New shipping routes and new opportunities to exploit natural resources abound with every ice sheet that melts, forming the focus of geopolitical competition in the Arctic. For example, the Northern Sea Route (NSR), located on the rim of Siberia to the far North, connects the Atlantic to the Pacific. It became ice-free for the first time in 2007.<sup>97</sup> Traveling through the NSR from Shanghai to Hamburg is 30% faster, on

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<sup>92</sup> "The thawing Arctic threatens an environmental catastrophe," *The Economist*, April 29<sup>th</sup>, 2017, <https://www.economist.com/news/briefing/21721364-commercial-opportunities-are-vastly-outweighed-damage-climate-thawing-arctic>

<sup>93</sup> Ibid.

<sup>94</sup> Roz Pidcock, "Reflections on a Changing Arctic," CarbonBrief, August 4<sup>th</sup>, 2013, <https://www.carbonbrief.org/reflections-on-a-changing-arctic-less-ice-means-faster-warming>

<sup>95</sup> Jonathan Masters, "The Thawing Arctic: Risks and Opportunities," Council on Foreign Relations, December 16<sup>th</sup>, 2013, <https://www.cfr.org/backgrounder/thawing-arctic-risks-and-opportunities>

<sup>96</sup> Daniel Glick, "The Big Thaw," *National Geographic*, <https://www.nationalgeographic.com/environment/global-warming/big-thaw/>

<sup>97</sup> Jonathan Masters, "The Thawing Arctic: Risks and Opportunities," Council on Foreign Relations, December 16<sup>th</sup>, 2013, <https://www.cfr.org/backgrounder/thawing-arctic-risks-and-opportunities>

average, than a voyage through the Suez Canal.<sup>98</sup> Most importantly, the NSR is relatively young, and the laws surrounding its use unclear. Questions of how these kinds of waterways are run, and who gets access to them, promise to heighten future tensions.

International laws regulating the sea are few and far between. The most famous, the 1982 U.N. Convention on the Law of the Sea (UNCLOS), hails from a different time. In 1982, the Arctic still lay covered in thick ice. Its 2008 reaffirmation, the Ilulissat Declaration, fails to address recent thaws and disputes. However, UNCLOS merits examination. Establishing navigation rights, territorial sea boundaries, exclusive economic zones, continental shelf rights, and forums for conflict resolution, it touches upon every issue a melting Arctic raises.<sup>99</sup> Unfortunately, the geography of the Arctic exposes its flaws. While UNCLOS applies well to large, open areas such as the greater Pacific, the Arctic is an ice-covered region ringed by competing countries, as territorial boundaries and exclusive economic zones often intersect. In spite of the Ilulissat Declaration ratifying the applicability of UNCLOS to the Arctic, these problems persist.

Take the Lomonosov Ridge as an example. It bisects the ocean while entering the “exclusive” zones of Canada, Denmark, and Russia.<sup>100</sup> The Northwest Passage running through Alaska and the Canadian Arctic Archipelago creates further controversy. The United States views it as an international strait, subject to the UNCLOS’s freedom of navigation rights. Canada views it as an internal waterway, giving the Canadians sole control over naval traffic passing through it.<sup>101</sup> Maritime boundaries further conflict in the Beaufort Sea, just to the northeast of Alaska. Yet again, Canada and the U.S. cannot agree on where their boundaries end in its waters.<sup>102</sup> Conflict continues in spite of legal frameworks, requiring a re-evaluation of Arctic law and diplomacy.

The far North’s wealth of natural resources and potential for expediting trade intensify disputes in the region. The Lomonosov Ridge includes several continental shelves. A country that successfully asserts its control over them instantly expands its Arctic presence.<sup>103</sup> Furthermore, the Northwest Passage offers a trading route several days shorter than one through the Panama Canal. Making it operational will hasten trade and shipping, allowing countries to reap economic benefits. Lastly, the oil-rich Beaufort Sea invites competition over energy resources. Just this past December, Italian oil producer Eni opened a new well off the Alaskan coast. Approximately ten kilometers in length, the new line produces over 20,000 barrels of oil a day.<sup>104</sup> In spite of the wealth to be gained, the Arctic’s proclivity for brutal storms and rough waters means that most countries and companies do not have the experience needed to complete prolonged operations. The Northwest Passage, for instance, assaults ships with gale-force winds.<sup>105</sup> These difficulties

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<sup>98</sup> Ibid.

<sup>99</sup> Robin R. Churchill, “Law of the Sea,” Encyclopaedia Britannica, <https://www.britannica.com/Law-of-Sea>

<sup>100</sup> Jonathan Masters, “The Thawing Arctic: Risks and Opportunities,” Council on Foreign Relations, December 16<sup>th</sup>, 2013, <https://www.cfr.org/backgroundunder/thawing-arctic-risks-and-opportunities>

<sup>101</sup> Ibid.

<sup>102</sup> “Beaufort Sea,” Historic Canada, <http://www.thecanadianencyclopedia.ca/en/article/beaufort-sea/>

<sup>103</sup> “Russia and Denmark could share the North Pole,” The Russian Geographical Society, April 10<sup>th</sup>, 2017, <https://arctic.ru/geographics/20170410/593547.html>

<sup>104</sup> “Oil and Gas firms begin drilling in Alaska’s Beaufort Sea,” December 31<sup>st</sup>, 2017, CBC, <http://www.cbc.ca/news/canada/north/eni-drilling-alaska-1.4468435>

<sup>105</sup> “The thawing Arctic threatens an environmental catastrophe,” *The Economist*, April 29<sup>th</sup>, 2017, <https://www.economist.com/news/briefing/21721364-commercial-opportunities-are-vastly-outweighed-damage-climate-thawing-arctic>

do not decrease competition, however. If anything, they promote a race for technological dominance of the Arctic, further exemplifying the shortcomings of international law.

Conquering the frozen waters requires especially advanced capabilities. In this regard, Russia leads the littoral powers. It operates the only nuclear-powered “icebreaker” fleet, specifically meant to open up shipping lanes, such as the NSR, and to defend areas of economic interest.<sup>106</sup> In September, it launched the largest to date—the *Sibir*. Weighing over 33,500 tons, its dual-reactor engine outstrips gas-powered competitors, such as America’s icebreaker fleet of two.<sup>107</sup> The gap has not gone unnoticed. In 2013, the Obama administration published its *National Strategy for the Arctic Region*, with the Pentagon outlining strategic objectives as well. The two documents focus on the need for stronger Arctic infrastructure supporting missile defense, strategic deterrence, maritime presence, and freedom of the seas.<sup>108</sup> Unfortunately, specific goals remain unidentified. There is no mention of deep-water ports, Coast Guard facilities, or icebreaker upgrades.<sup>109</sup> Contrast this with the approach of Russia. A revamping of Soviet-era hydrometeorological services, airfields, and further additions to its Arctic navy form the core of its geostrategic policy.<sup>110</sup> By the looks of it, the search for tactical advantages threatens the very freedom of the seas enshrined in UNCLOS and the Ilulissat Declaration.

The biggest problem reflected by the adoption of Arctic “strategy” is not an increased likelihood of conflict, however. The fact that the regional powers view the melting ice as a means of achieving military dominance and resource wealth is madness. A disappearing Arctic is first and foremost an environmental catastrophe. Instead of competing over how best to exploit it, the Arctic Council should focus on saving it. Here, international law can light the path forward. UNCLOS and the Ilussitat Declaration, while toothless in preventing confrontations, do provide basic principles that affix themselves to the discussion of maritime rights. Freedom of navigation and state sovereignty, for instance, ideologically check one nation’s supremacy in the region.

Similarly, further laws could help establish limits on the militarization of the region, as well as regulate the presence of oil firms and the construction of their wells. Rather than investing in icebreaker fleets and airfields, countries should spend money on geo-engineering efforts that encourage ice formation. Geostrategic conflict already grips the world, whether in the sands of Afghanistan or the waters of the South China Sea. The last thing the world needs is another theatre of military rivalry. To prevent that from materializing, legal diplomacy and negotiation must substitute for defense spending in the frozen North.

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<sup>106</sup> Tom O’Connor, “Russia Leads World With New Icebreaker Ship,” *Newsweek*, September 25, 2017, <http://www.newsweek.com/russia-deploys-worlds-largest-and-most-powerful-nuclear-icebreaker-ship-bring-670621>

<sup>107</sup> Ibid.

<sup>108</sup> John P. Holdren, Amy Pope, Mark Brzezinski, “Advancing Implementation of the National Strategy for the Arctic Region,” The White House, March 9<sup>th</sup>, 2016, <https://obamawhitehouse.archives.gov/blog/2016/03/09/advancing-implementation-national-strategy-arctic-region>

<sup>109</sup> Mihaela David, “U.S. National Strategy for the Arctic Region: Strong Foothold or on Thin Ice?” May 13<sup>th</sup>, 2013, The Arctic Institute, <https://www.thearcticinstitute.org/us-national-strategy-for-arctic-region/>

<sup>110</sup> Tom O’Connor, “Russia Leads World With New Icebreaker Ship,” *Newsweek*, September 25, 2017, <http://www.newsweek.com/russia-deploys-worlds-largest-and-most-powerful-nuclear-icebreaker-ship-bring-670621>

# Uncontrolled Expansion: Urban Sprawl, Economic Inequality and Environmental Degradation

By: Marianna Kalander

No modern instances of mass human migration have come without at least some destruction to the environment. Overpopulation and economic development have conflated inequality and environmental pollution globally, creating phenomena such as urban sprawl. A reality produced through urbanization, urban sprawl occurs when people migrate from highly populated cities to less populated rural lands to start a new life. Inequality of resources and wealth between developed and developing nations leads the impact of urban sprawl on the environment to be more negatively profound in developing nations. Developed nations, such as the United States, can mitigate the environmental harm of urban sprawl through providing cleaning services or making sustainable infrastructure available, which are features that developing nations cannot afford to provide. Urban sprawl is also a recurring process and will continue to damage developing nations if the inequality gap is not meaningfully addressed.

Urban sprawl occurs primarily as a symptom of overpopulation, especially in developing nations. Cities, especially capital cities, tend to be the most densely populated. Thus, people will migrate from these cities and migrate to periphery rural areas where they start a new life. For example, New Delhi is the capital city of India, a developing nation, and it is extremely over-populated. Therefore, the city is facing and will continue to face high rates of urban sprawl as the population of New Delhi continues to grow. Studies predict that “the Delhi urban agglomeration will have a population of 28.6 million by 2025.”<sup>111</sup> People in cities like New Delhi are forced to diffuse outward due to overpopulation, as explained by Strike: “As regional population continues to increase, communities begin to spread farther and farther away from city centers.”<sup>112</sup> However, the periphery areas tend to lack resources as cities and capitals tend to be the economic ‘hearth’ and full of resources. This deprivation is very prominent in developing countries as there is less resources per capita in cities. As populations increases and resources become scarce, people tend to move farther from the city, where resources may become even more scarce.

Developed countries have a considerably larger amount of resources compared to developing countries. As a result, developed countries are able to lessen the environmental impact when urban sprawl occurs. These countries, such as the United States, are economically and logistically equipped to provide for their people that choose to move to rural lands relative to developing nations. Damage to the environment does occur, such as “increasing air and water pollution, devouring wetlands and forests,”<sup>113</sup> but developed nations do a better job lessening the environmental impact, through ‘green’ buildings or providing goods and services like trash pickup. Urban sprawl, however, tends to be more abrupt and unplanned in developing nations as rural lands are “often highly polluted owing to the lack of urban services, including running

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<sup>111</sup> Dash, Dipak Kumar. “Delhi and Mumbai in World's Top Four Urban Sprawls.” *The Times of India*, India, 24 Oct. 2012, [timesofindia.indiatimes.com/india/Delhi-and-Mumbai-in-worlds-top-four-urban-sprawls/articleshow/16945450.cms](http://timesofindia.indiatimes.com/india/Delhi-and-Mumbai-in-worlds-top-four-urban-sprawls/articleshow/16945450.cms).

<sup>112</sup> Striker, Dee. “What Are the Causes of Urban Sprawl?” *Home Guides | SF Gate*, [homeguides.sfgate.com/causes-urban-sprawl-2577.html](http://homeguides.sfgate.com/causes-urban-sprawl-2577.html).

<sup>113</sup> Eberhard, William. “Sprawl 101: How Sprawl Hurts Us All.” *Eberhard Architects*, Apr. 2009, [www.eberhardarchitects.com/pdfs/Sprawl%20101.pdf](http://www.eberhardarchitects.com/pdfs/Sprawl%20101.pdf)

water, sewer, trash pickup, electricity or paved roads,”<sup>114</sup> and governments are ill-equipped to control the damage. States in developing countries do not provide the same environmental services that developed nations do, and urban sprawl’s footprint on the environment continues unabated.

Urban sprawl is truly a global issue, in that it poses a grave environmental threat to states of all levels of economic development. One of the benefits enjoyed by developed nations is the possession of various types of infrastructure from roads to bridges. However, in many developed nations, infrastructure is also a supporting cause of urban sprawl. Roads are blanketed with potholes and bridges are rusting, becoming less safe for use. People here will migrate to rural areas and make newer, safer infrastructure. In the U.S., many state governments will subsidize the costs of making new infrastructure in rising, rural communities. For example, one study showed that “the most sprawled American cities spend an average of \$750 on infrastructure per person each year”<sup>115</sup>. Yet, infrastructure subsidies only exist and are available in developed, wealthy countries. In developing nations, as people migrate to rural lands, infrastructure needs exist but states do not have the capacity to subsidize the costs of urban sprawl.

Overall, urban sprawl has negative impacts to the environment, one being air pollution. The distance from rural areas to the resources of nearby cities leads to the fact that “living outside the city makes having a car almost a requirement”<sup>116</sup>. Being far from cities means that many products will have to be imported. This added need for resources also increases the amount of cars coming in and out which contributes to the hindering of air pollution. The increase in car usage can contribute to more air pollution as “research shows that urban areas are responsible for about 80 percent of total vehicle CO<sub>2</sub> emissions growth in the U.S. since 1980 as cities have sprawled far beyond their urban cores”<sup>117</sup>. Unsurprisingly, as urban sprawl has increases, so do rates of pollution.

Urban sprawl also damages forests. In developed nations, as people arrive to rural lands, whole new communities arise which entail the construction of houses and buildings. “The construction of roads and buildings destroys farmland and wildlife habitat,”<sup>118</sup> as trees would have to be cleared and animals would be forced out of their homes. In terms of the environmental impact, air quality would reduce with the lessening in numbers of trees, since forests are “carbon sinks” which are able to capture greenhouse gases emitted by human-activities. Wildlife would be forced away, decimating local ecosystems and potentially inhibiting the ability of the people living there to hunt and provide for themselves. Urban sprawl can lead to even worse environmental damage in developing nations. Migration to rural lands may occur more quickly and abruptly, which makes construction occur in an unorganized manner. For example, rural

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<sup>114</sup> Bhatta, Basudeb. “Analysis of Urban Growth and Sprawl from Remote Sensing Data.” *Basudeb Bhatta | Springer*, Springer-Verlag Berlin Heidelberg, 2010, [www.springer.com/us/book/9783642052989](http://www.springer.com/us/book/9783642052989).

<sup>115</sup> *Release: Urban Sprawl Costs US Economy More than \$1 Trillion per Year | New Climate Economy | Commission on the Economy and Climate*, The New Climate Economy, 15 Mar. 2015, [newclimateeconomy.net/content/release-urban-sprawl-costs-us-economy-more-1-trillion-year](http://newclimateeconomy.net/content/release-urban-sprawl-costs-us-economy-more-1-trillion-year).

<sup>116</sup> “Urban Sprawl.” *Urban Sprawl Pros and Cons*, 1 Jan. 1970, [promote-smartgrowth.blogspot.com/2010/05/urban-sprawl-pros-and-cons.html](http://promote-smartgrowth.blogspot.com/2010/05/urban-sprawl-pros-and-cons.html).

<sup>117</sup> Magill, Bobby. “Urban Sprawl, Cars Hamper Cities’ Best Efforts on CO<sub>2</sub>.” *Climate Central*, 6 Apr. 2015, [www.climatecentral.org/news/city-tailpipe-emissions-18861](http://www.climatecentral.org/news/city-tailpipe-emissions-18861).

<sup>118</sup> Laine, Martin. “Urban Sprawl Pros Vs. Cons.” *Synonym*, 29 Sept. 2017, [classroom.synonym.com/urban-sprawl-pros-vs-cons-12080399.html](http://classroom.synonym.com/urban-sprawl-pros-vs-cons-12080399.html).

communities in developing nations often do not construct roads using modern resources, so problems such as “unpaved forest roads that can be a major cause of erosion, gullyng, and stream sedimentation”<sup>119</sup> arise.

There are many alternatives that cities can do that will help stymie urban sprawl. One large alternative is new urbanism. Cities can offer mixed types of housing that are closer in proximity to the city, such as houses and apartments. This will not only benefit those that have different numbers in their household but will also allow people to live “farther” from the main city, while also working in the city, without completely moving out to a rural areas, thus preventing urban sprawl. Another factor of new urbanism that cities can achieve is “a mix of shops, offices, apartments, and homes on site”<sup>120</sup>. Having a variety of places such as shops will attract more people to stay. As a result, different kinds of populations to be drawn into the city and not live out in a rural community. While promising, new urbanism and the dynamic planning models it suggest cannot be realized by poorer nations lacking the technology and capital resources to combat the challenges of urban sprawl on the environment. Without the intervention of wealthy states or international organizations, it is improbable to expect the process of development for much of the world to be anything short of environmentally catastrophic.

Urban sprawl is a contributor to environmental damage. Solutions can be made to slow and prevent urban sprawl, but these only exist in wealthy, developed nations. Thus, developed nations may need to assist developing nations in the act of stymying the negative environmental impacts of urban sprawl. If the environment is not preserved and taken care of globally, then eventually there will be no land for people to move to at all.

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<sup>119</sup> “The Nexus Between Infrastructure and Environment.” *The Nexus Between Infrastructure and Environment*, The World Bank, 2007. [http://siteresources.worldbank.org/INTOED/Resources/infrastructure\\_environment.pdf](http://siteresources.worldbank.org/INTOED/Resources/infrastructure_environment.pdf)

<sup>120</sup> Diehl, Rachel. “» Alternatives to Urban Sprawl.” *Museum of the City*, [www.museumofthecity.org/project/alternatives-to-urban-sprawl/](http://www.museumofthecity.org/project/alternatives-to-urban-sprawl/).