

GLOBAL CONVERSATIONS



THE GLOBAL CLIMATE CRISIS

FALL 2019 ISSUE



Fall 2019 Cover Description

The cover design for this issue depicts the detrimental impact of current production and consumption patterns on the planet. The spherical image represents the disappearing ice caps, glacier melt, and the rising sea levels, contrasted with an increase in cases of devastating forest fires. The burning pile of coal and lumber at the base of the image represents our earliest methods of harnessing external fuel sources used to build human civilization, while the forest represents our commoditization and over-exploitation of natural resources ever since. The glass city is on the edge of the chaos - polluting, consuming, and profiting while contributing to the climate crisis.

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Letter from the Editors in Chief

As the new Editors in Chief of Global Conversations, we are proud to present the first issue of the 2019-2020 academic year. We would like to thank our dedicated team of writers and editors who continue to carry forward and contribute their time and effort to this student-run publication. We would also like to take this opportunity to thank the administrative team at the Munk School of Global Affairs and Public Policy for their continued support.

Global Conversations continues to reflect the diverse and distinct views of students at the Munk School. This creative outlet serves as a platform for both reflection and speculation on some of the most pressing issues facing our generation. It is with this purpose in mind that we decided to focus this Issue on the Global Climate Crisis. As we reflect on the events of the past year, it is increasingly clear, as evidenced by the #FridaysforFuture movement, that climate change and the impetus for climate action will define 2019.

Spanning six regions and twelve diverse topics, this Issue brings to light some of the most pressing environmental challenges from across the globe. Our writers further examine the many ways by which citizens, practitioners, and world leaders are attempting to tackle the current climate emergency. We invite our readers to join the global conversation, and we hope that this Issue will inspire all of us to think more critically about our impact on the planet, and the important role we can play in preserving it for future generations.

*Editors in Chief,
Mackenzie Rice & Sorena Zahiri*

Introduction

In 2019, the world began to fully appreciate the reality of climate change.

In 2019, millions protested all over the world demanding that politicians heed scientists' warnings of rising global temperatures and enact effective climate policy. Sixteen-year-old Swedish climate activist, Greta Thunberg, crossed the Atlantic ocean on a zero-emissions sailboat to speak at the United Nations, where her accusation of world leaders resonated across the globe: "How dare you?!"

In 2019, Oxford Dictionaries aptly named "climate emergency" its Word of the Year. Collins Dictionary selected "climate strike," in reference to the weekly protests initiated by Thunberg that featured millions of voices demanding climate action in cities across the world.

In 2019, people became newly aware of the environmental damage caused by human behaviours such as fast fashion and meat over-consumption. Clean capitalism became cool, with companies finding themselves increasingly held to account for their sustainability practices by investors, employees, and consumers. The Canadian election, among others, was largely won on climate change. The younger generation began suing governments, arguing that climate inaction amounts to human rights violations.

Yet, in 2019, environmental disasters caused unprecedented damage around the world. Devastating extreme weather events such as Hurricane Dorian and Typhoon Hagibis caused dozens of casualties, left thousands stranded, and resulted in billions of dollars in damages. Air quality in New Delhi has become deadly, in part because of continued pollution from coal power plants and factories. The UN's 2019 emissions gap report estimates that meeting some of the Paris Climate Accord's strictest goals will require a 7.6 per cent reduction of global greenhouse gas emissions between 2020 and 2030. A failure to meet these objectives will have disastrous effects across the globe with disproportionate impacts on developing states, including coral reef dissolution, flooding of coastal communities, extreme heat waves, and desertification.

For the Fall 2019 Issue of Global Conversations, we asked our writers to illustrate some of the pressing global stories related to climate change. We were answered with articles expressing deep concern about the effect that climate change is having on the Earth, but also with great optimism of a new generation fighting for climate action worldwide. We are the cause of climate change. But in 2019, many of us became part of the solution.

*Directors of Written Content,
Alexandra Harvey & Isaac Crawford-Ritchie*

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Emissions Accounting: Making sense of the numbers behind the climate crisis

BY ALI CANNON | ENVIRONMENT & CLIMATE CHANGE



DISCUSSIONS about climate change have been growing in prominence in recent years. In the 2019 Canadian federal election, climate change emerged as the number one concern for voters. In the current U.S. election cycle, climate change is climbing the list of voters' concerns, with nearly 40 per cent citing the issue as critical in determining how their vote will be cast. This year has also seen unprecedented turnout at climate rallies as the Fridays for Future movement, inspired by Greta Thunberg, has gained traction around the world.

While this increase in public attention to climate change is undoubtedly beneficial, it remains crucial to focus the discussion on the underlying sources of emissions that contribute to climate change. Only a thorough and contextualized understanding of emissions sources can facilitate the development of effective policies grounded in

facts. Beyond current emission trends, we must also look toward more telling statistics, namely cumulative emissions, per capita emissions, and trade-adjusted emissions. A detailed breakdown of the latest data from the Global Carbon Project reveals some important trends in greenhouse gas (GHG) emissions that should be included in the public debate on climate change and form the basis for global environmental policy going forward.

GLOBAL EMISSION TRENDS

GHG emissions – including carbon dioxide, nitrous oxide, methane and other carbon dioxide equivalents – have risen dramatically since the start of the industrial revolution. GHGs warm the planet by slowing the rate at which solar energy absorbed at the Earth's surface can be radiated back from the atmosphere into space.

Since pre-industrial times, global average surface temperature has increased by approximately 1.2 degrees Celsius. However, the patterns of warming are not evenly distributed. Since 1850, the global North has seen temperature increases around 1.4 degrees Celsius, while the global South has experienced a lower warming of approximately 0.8 degrees Celsius. The temperature changes are particularly acute in Canada, which is warming on average at a rate twice as fast as the rest of the world.

Annual global emissions of carbon dioxide have been growing year over year since industrialization. Carbon dioxide emissions totaled only 2 billion tonnes in 1900, compared to the 37 billion tonnes emitted in 2018. The 2018 levels also accounted for a 2.7 per cent increase from the previous year, after only a 1.6 per cent increase in 2017.

Total emissions can be broken down regionally to give us a picture of where most carbon dioxide output originates. In terms of annual carbon dioxide emissions, China clearly dominates. At ten billion tonnes a year, the country

accounts for more than one quarter of global emissions. From a regional level, Asia accounts for just over half of global emissions. After Asia, North America is the second largest regional emitter, accounting for 18 per cent of global emissions. This is only slightly higher than E.U. countries, which emit 17 per cent of global GHGs.

ADDITIONAL DIMENSIONS

Annual emissions by region are a good starting point for analysis, but they do not always tell the full story. We need to examine cumulative emissions, per capita emissions, and trade-adjusted emissions to have the context needed for evidence-based decision-making. Looking at cumulative emissions since 1751, the U.S. accounts for approximately 25 per cent of all historical emissions, with 400 billion tonnes. They are once again closely followed by E.U. countries, which account for approximately 22 per cent of historical emissions. Both of these regions have emitted more than twice as much carbon dioxide as China. These numbers are particularly important in the context of international climate negotiations, where we see a clash between large historical emitters and current-day emitters.

Per capita emissions also tell an interesting story. Oil producing countries account for the highest carbon dioxide per capita emissions. As of 2017, Qatar had the highest per capita emissions at 49 tonnes per person. It is followed by Trinidad and Tobago, Kuwait, and the United Arab Emirates. However, each of these countries have relatively small populations, meaning their total annual emissions remain low. Countries with larger populations and the highest per capita emissions include the U.S., Australia, and Canada. Each of these three countries have per capita emissions above 15 tonnes annually. These figures stand in stark contrast to the global average of per capita emissions of 4.8 tonnes per person per year.

All the previously stated figures for carbon emissions were calculated using a production-based accounting method. It is equally important, however, to consider a consumption-based accounting method, where emissions are adjusted for trade and assigned to where end-products are actually consumed. This method of accounting allows us to understand whether countries are achieving emission reductions simply by offshoring their carbon-intensive manufacturing and production to other countries. Certain countries like Ireland, Norway, and Switzerland have

had stagnant production emissions, but experienced an increase in consumption emissions – evidence of offshoring. On the other hand, countries such as the U.K., Germany, France, and the U.S. have seen falling production and consumption-based emissions. This suggests that these countries are achieving genuine emission reductions.

EMISSION FIGURES IN ACTION

Overall, it is evident that the method of analysis significantly reframes how we understand climate-changing carbon emissions. For instance, when the topic of climate change arises during national elections in Canada and the U.S., the power of context now becomes abundantly clear. While Andrew Sheer incessantly emphasized on the campaign trail that Canada only generates around 1.6 per cent of global emissions, we must recognize the fact that Canada has some of the highest per capita emissions in the world. Likewise, American voters should acknowledge their country's exorbitant historical emissions when criticizing China's environmental impact.

GHG emissions that cause climate change are global, intertemporal, and personal all at once. Building a well-rounded toolkit of emission statistics affords us the ability to effectively understand and communicate the nuances of carbon emissions when casting votes, creating policy, or negotiating international agreements. Knowing the facts at the heart of the climate crisis will empower decision making and lay the foundation for effective climate action.



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Global Trade of Plastics: A painful stalemate between the developed and developing worlds

BY WILSON WEN | INTERNATIONAL TRADE & BUSINESS



IT has been almost two years since China decided to ban imports of plastic waste, and the world is feeling the effects. No longer able to ship their plastics to China, developed countries – including the U.S., Canada and much of Europe – all find themselves struggling to get rid of their recyclable plastic waste. Moreover, as the *Nikkei Asian Review* reports, their attempts to relocate plastic waste shipments to Southeast Asia have encountered fierce opposition from governments in the region. With Asian countries refusing to accept plastic waste exports and recyclable plastic waste quickly accumulating at home, people in the developed world have been dragged into a global waste management crisis.

GLOBAL PLASTIC WASTE SUPPLY CHAINS AND CHINA'S BAN

Today, the world is producing plastic at a faster pace than ever before. In the 1950s, the world produced two million tonnes of plastics every year. But by 2015, the annual

figure reached 381 million tonnes. As a result, generation of plastic waste has been enormous. According to a recent study published in the journal *Science Advance*, the world has produced 6.3 billion metric tonnes of plastic waste in the past six decades. Researchers predict that if the current trend of plastic waste production continues, by 2050 there will be at least 15.2 billion metric tonnes of plastic waste globally. *Deutsche Welle* further reports that developed countries – especially the U.S., Germany, Australia, and Japan – are the world's biggest producers of plastic waste.

To deal with accumulating plastic waste, developed countries have traditionally adopted an 'out of sight, out of mind' approach, relying on China as the main destination for their discarded plastics. From the 1990s to 2017, China accepted over 50 per cent of the world's total used plastics. In 2017 alone, China imported seven million tonnes of plastic waste. In total, prior to China's ban, 95 per cent of recyclable plastic waste in the European Union and 70 per cent of waste in the U.S. was exported to China. The total value of the Sino-U.S. plastic waste trade had generally been around \$400 to \$500 million USD annually.

Since China was at the heart of the global plastic waste trade, its decision to ban plastics imports has prompted a global waste management crisis. In January 2018, China enacted the "National Sword" policy to ban the import of plastics, cardboard boxes and other recyclable waste. As a result of this policy, by the beginning of 2019, China's plastics imports have plummeted by 99 per cent. The ban has caused serious problems for developed countries. Japan, for instance, has struggled to deal with the 500,000 tonnes of plastic waste that it previously would have exported to China. Similarly, Australia is struggling to dispose of its 1.3 million tonne stockpile of recyclable waste.

PHOTO SOURCE: FLICKR, JASON SWAIN

COULD SOUTHEAST ASIA BE THE ALTERNATIVE ?

Given the Chinese ban, Southeast Asian countries – most notably Malaysia, Vietnam, Thailand, Indonesia, and the Philippines – have emerged as alternative destinations for foreign shipments of plastic waste. According to the *Nikkei Asian Review*, immediately after the ban, American companies redirected 200,000 tonnes of plastic waste shipments from China to Malaysia. Similarly, Japan diverted the shipment of 190,000 tonnes of plastic waste from China to Thailand.

But the shift has caused significant problems, as Southeast Asian countries do not have the right recycling facilities or regulatory environments to manage the enormous plastic waste inflow. As *Deutsche Welle* reports, given the inadequacy of local recycling facilities, it is not uncommon for plastic imports intended for recycling to end up being tossed into rivers, oceans, and landfills. *South China Morning Post* further reveals that even within existing recycling plants, the way that plastic waste is processed has often caused serious health problems for local populations. For example, until this year, many plastic recycling plants in the Malaysian capital of Kuala Lumpur were still operating in violation of safe emission standards and without proper permits. Residents suffer from anxiety, fatigue, and lung-related problems caused by the toxic fumes. One local resident, Pua Lay Pent, described the situation: “People were attacked by toxic fumes, waking them up at night. Many are coughing a lot.”

As plastic waste imports have become overwhelming, Southeast Asian governments have been taking an increasingly hardline stance against plastic waste imports. After a diplomatic confrontation in June, Filipino President Rodrigo Duterte successfully pressured the Canadian government to take back 69 containers of waste. Indonesia and Malaysia are also seeking to send back thousands of tonnes of plastic waste to Europe and the U.S. In addition to sending back imported garbage, Thailand and Vietnam have even planned to ban foreign plastic waste imports to their countries by 2021 and 2025 respectively.

THE FUTURE OF GLOBAL WASTE MANAGEMENT

The pushback of Asian countries against plastic waste imports has sent the clear message that plastic waste management is not an issue that can be permanently outsourced. And yet, developed countries – including the U.S. – are far from ready to manage plastic waste on their own. *The Atlantic* notes that Americans have become used to offshoring the burden of waste management to low-paid workers overseas and have not developed their own effective mechanism for recycling plastic waste. According to the National Waste & Recycling Association, roughly 25 per cent of the items that end up in U.S. recycling bins are contaminated, toxic nonrecyclables – partly because Americans tend to have limited knowledge about what can and cannot be recycled. The fact that new plastics are relatively cheaper to manufacture has further discouraged American companies from collecting and processing recyclable plastics.

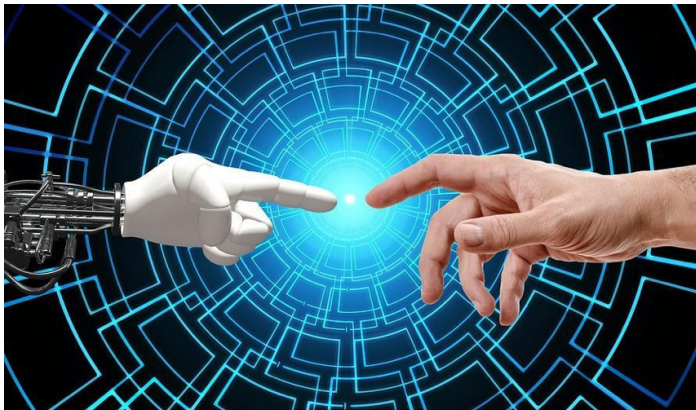
So far, the international community lacks any feasible long-term solution for addressing the plastic waste problem. While developing countries lack the infrastructure and regulatory capacity to enforce effective waste management, developed countries – which have been used to offshoring plastic waste – are also struggling to develop up-to-date waste management mechanisms. The ongoing disputes between Asia and the West over waste imports suggest that the international community remains too divided to come up with effective and holistic approaches for dealing with plastic waste. With the amount of plastic waste continuing to grow at an unprecedented rate, the global waste management crisis is likely to get worse.



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Think Different: Leveraging AI to combat the global climate crisis

BY ABE RAVI | TECHNOLOGY & INNOVATION



THE Intergovernmental Panel on Climate Change (IPCC) released a watershed report in October 2018 which alarmed scientists and policymakers. It declared that the global community has a 12-year deadline to effectively combat and limit the effects of climate change. Specifically, the authors of the study announced that the world must cut its greenhouse gas (GHG) emissions in half by 2030 in order to constrain global warming to 1.5 degrees Celsius (2.6 degrees Fahrenheit) above preindustrial temperatures. According to the Climate Action Tracker – an independent scientific body – only two countries are currently compliant with the 1.5 degree climate commitment: Morocco and The Gambia. But for countries struggling to comply with the goals stipulated by the Paris Climate Agreement (PCA), there is a potential technological solution on the horizon. Many scientists and academics have begun to argue that artificial intelligence (AI) could prove to be a useful tool to supplement emission reduction strategies.

AREAS OF APPLICATION

A breakthrough paper published in June 2019 called Tackling Climate Change with Machine Learning identified 13 distinct areas where machine learning could be implemented to effectively and efficiently combat climate change. These distinct areas include: (1) electrical systems; (2) transportation; (3) buildings and cities; (4) climate prediction; (5) carbon dioxide removal; (6) solar geoengineering; (7) green finance; (8) farms and forests;

(9) societal impacts; (10) tools for individuals; (11) tools for society; (12) education; and, (13) industry. The renowned authors of the paper – which include Google Brain co-founder Andrew Ng, DeepMind CEO Demis Hassabis and Turing award winner Yoshua Bengio – argue that the AI renaissance can be used to fight climate change through strategies such as leveraging AI to model the Earth's climate, using machine vision to monitor the environment, and pinpointing inefficiencies in emission-heavy industries using data analysis.

The authors argue that AI can be used to build efficient electricity systems as showcased by Google's DeepMind which has successfully predicted the energy output of wind farms. Specifically, machine learning can be used to anticipate energy demand and integrate renewable energy into national electrical grids which would reduce waste. Likewise, AI can be used to monitor agricultural emissions and deforestation as these are both prime sources of GHG emissions. For example, AI and satellite imagery can be used to protect natural carbon sinks as the destruction of these sinks releases vast amounts of GHGs into the atmosphere. Similarly, AI can be a huge ally for businesses related to concrete and steel production, which are highly carbon intensive, as it can allow them to design low-carbon substitutes to these resources. Machine learning can also be used to model and predict extreme weather events and by extension protect vulnerable populations from droughts, storms, floods, and tsunamis. Moreover, AI can make transportation more efficient by increasing vehicle efficiency, promoting carpooling through ride-sharing software (e.g. Uber and Lyft), and reducing car usage through the commercialization of autonomous vehicles. Transportation is an important area as it accounts for 25 per cent of global carbon dioxide emissions. Machine learning can also reduce energy waste from buildings by retrofitting them with smart sensors to reduce energy usage by up to 20 per cent. This is one of the easiest areas of implementation as sensors can easily monitor air temperature, water temperature, and energy use at a low cost.

LOCAL LEVEL APPLICATION

AI has several applications for climate change prevention and mitigation as it can help both local actors at the grassroots level and large-level institutions at the macroscopic level. For example, local Indian farmers have partnered with researchers to increase groundnut yields by 30 per cent by leveraging machine learning to optimize the application of fertilizer and sowing dates. Likewise, the Government of Norway has used machine learning to transform its energy grid by making the existing architecture more flexible and autonomous. Furthermore, deep learning has allowed researchers to identify tropical cyclones with 89 to 99 per cent accuracy, information that can help save lives and minimize damage to vital infrastructure.

“... AI can provide policymakers with powerful tools that they can use to devise innovative strategies and transformative policy guidelines.”

The potential for the application of AI to the problem of climate change is significant, a notion that is epitomized by Microsoft’s *AI for Earth* program. The program has pledged \$50 million USD over the next five years in order to create and test new applications for AI. Microsoft’s AI for Earth program has seen some early success in the following three key areas of study: Columbia University is using the software to learn how tropical storms affect the distribution of tree species in Puerto Rico; Washington State University is building an ecosystem management model to re-establish diminishing steelhead and salmon populations; and, the University of Southern California is using its Protection Assistant for Wildlife Security (PAWS) program to accurately determine where poaching might occur in the future by studying real-time data from ranger patrols.

MITIGATING THE POTENTIAL RISKS

Despite the excitement surrounding AI, the deployment of this technology must be matched with rigorous safeguards. For example, a World Economic Forum report

identified six categories of AI risk which include performance, security and control, as well as economic, social, and ethical risk. AI has an inherent performance risk as the black box nature of the technology makes it risky as an early warning system for natural disasters since it is impossible to determine if the AI’s result is accurate or desirable. Likewise, there are inherent security risks associated with the application of AI technologies, as they may be vulnerable to hacking and other forms of malicious interference. Furthermore, AI is associated with control risk as AI systems interact autonomously and can yield arbitrary outcomes. Similarly, this technology is associated with economic and social risks as it can both marginalize smaller enterprises, and result in large-scale unemployment. Additionally, there are ethical risks with the use of AI as it can reflect and magnify the biases related to groups and communities. Therefore, stakeholders in the public and private sectors must ensure the transparency, safety and validity of AI application.

NEW FRONTIERS

Given these drawbacks, AI is not a silver bullet solution that can completely resolve the global climate crisis. However, AI can provide policymakers with powerful tools that they can use to devise innovative strategies and transformative policy guidelines. AI can empower businesses to shift away from supply chain and logistic structures that are highly carbon-intensive and towards a more sustainable model. Therefore, AI will open new frontiers that will empower the global community to achieve ambitious climate change goals by promoting sustainable consumption and development.



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Climate change is shifting global health into gear – just the wrong one

BY ZISSIS HADJIS | GLOBAL HEALTH



CLIMATE change has a large-scale impact on human health. Increased pollution negatively affects air quality, more frequent droughts turn once-arable land infertile, and violent floods and storms often wipe out exposed critical medical infrastructure.

While richer nations attempt to fortify their medical infrastructure and health systems, poorer nations are hindered with limited resources to do the same. As a result, the increasingly tangible consequences of climate change threaten to reverse years of progress made in global health. The positive gains made in this field will likely be undone if climate change continues unabated, especially in less resilient areas of the world such as the Global South.

HEALTH IMPACTS

The consequences of climate change affect many facets of the health system. While children, the elderly, and pregnant people face the highest risk of death and injury from extreme weather events, the climate crisis poses risks to all channels of healthcare delivery.

An article from the *New England Journal of Medicine*

published in August 2019 outlines exactly how climate change interacts with “human health, the practice of medicine, and the stability of health care systems.” Dr. Renee Salas, co-author of the report, outlines how this can materialize across all medical specialties, ranging from heart and lung diseases to digestive illnesses. Infectious diseases, nutrition, and mental health are also areas that will be heavily impacted by climate change. For example, Europe’s massive heat wave in 2003 was responsible for an estimated 70,000 deaths, mostly caused by cardiovascular and respiratory issues. More frequent droughts could also deplete previous resource-abundant and fertile land, leading to both food insecurity and increased food prices, and resulting in undernutrition and famine in certain regions.

Countries with limited adaptive capacity will be hit hardest by these devastating consequences. These states are often concentrated in the Global South, and include countries like Kenya, Ethiopia, Senegal, and many others. The effects of climate change on health are closely tied to development policy and health equity. Refusing to implement robust mitigative and adaptive solutions will leave millions struggling to access healthcare services in regions like Sub-Saharan Africa (SSA).

SUB-SAHARAN AFRICA: REGION AT RISK

SSA has accounted for the least greenhouse gas (GHG) emissions as compared with other regions of the world. However, this region will see the largest reversal in global health outcomes. A quantitative risk assessment of the effects of climate change published by the World Health Organization (WHO) in 2014 calculates the exact impact of this backward trend. Even under optimistic estimates of “economic growth and health progress,” the report estimates an additional 250,000 deaths per year from 2030 to 2050 due to climate change related factors.

PHOTO SOURCE: FLICKR, LOGAN ABASSI

The mortality caused by disease will largely fall on children in developing countries.

“The effects of climate change on health are closely tied to development policy and health equity.”

The aftermath of extreme weather events, such as flooding, can also bring about more outbreaks of transmittable diseases. For example, massive flooding caused outbreaks of cholera in Mozambique in 2000 and 2013. In the spring of 2019, Mozambique was hit with two cyclones in 60 days. The latter of the two, Cyclone Kenneth, was the strongest to ever hit the continent. Cyclone Kenneth killed 45 people, wiped out 40,000 homes, and caused a cholera outbreak within days of hitting the shore.

Another study indicates that the expected warming of 1.2 to 1.7 degrees Celsius by 2050 would cause levels of undernutrition in SSA to increase by as much as 90 per cent compared to current numbers. Rising temperatures may also shift the geographic distribution of diseases transmitted by mosquitoes, like malaria, leaving previously unaffected regions at risk.

Many of the most exposed countries in SSA already have overburdened and underfunded health infrastructure systems. While the data shows that challenges to healthcare delivery will be exacerbated in the future, there is still a need for better evidence on how to create targeted adaptation strategies. However, there is debate as to who should be providing this information.

On October 25, 2019, the U.S. government cut funding for Predict, a surveillance program that tracks some of the world’s deadliest diseases. If climate change continues to devastate critical infrastructure in SSA, the entire continent risks being further exposed to deadly flu strains and Ebola, among other diseases. With this recent cancellation, the world will have less information and thus be ill prepared to respond to outbreaks. If SSA is to avoid

massive health repercussions from climate change, technologies like Predict will be essential to their success.

WHAT NOW ?

Even if countries manage to reach their emission targets as outlined by the Paris Agreement in November 2016, the effects of climate change will be prominent. Creating and implementing adaptive solutions is crucial to mitigating the reversal of global health progress in regions like SSA. This will require pledges from local and national governments to reduce emissions, better monitoring and surveillance of disease incidence, and a stronger commitment to establishing more resilient medical infrastructure systems.

Proactive measures are beginning to emerge in some countries in SSA. For example, the Government of Benin expanded national health insurance to cover diseases that are expected to become more widespread with rising temperatures and sea levels, given that the country is prone to flooding. Undertaking research to evaluate the preparedness and resilience of specific regions will elucidate current weaknesses to the healthcare system and allow tailored policy to emerge.

Governments can no longer ignore the health impacts of climate change. As donors look to continue driving progress in global health, it is essential that climate change and sustainable development remain at the forefront of policy decisions. Underestimating the significance of climate change will put many future lives at risk. Unless drastic mitigative and adaptive strategies are put in place now, years of global health progress will evaporate within the next few decades.



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Putting Poverty on Hold: The climate crisis' impact on development goals

BY KATIE SHUTER | GLOBAL DEVELOPMENT



LOW-INCOME and lower-middle-income countries (LMICs) are at the front line of the climate crisis. Despite historically contributing fewer greenhouse gas (GHG) emissions than their richer counterparts, LMICs will bear the brunt of the negative impacts of climate change. The World Bank estimates that climate change will push an additional 100 million people back into poverty by 2030, resulting in an inability to cope with rising climate risks. Precarious geographies, a lack of resources, and already-vulnerable communities mean LMICs are at a particular disadvantage in the face of rising sea levels and consequential impacts on agricultural production.

The unequal burdens of the climate crisis are stark. The wealthiest nations, which have accumulated their wealth through the unrestricted production of GHGs and the exploitation of vulnerable states, will be the most well-equipped to adapt to our environment's changing landscape. Historically, wealthier nations were able to industrialize rapidly partly due to the exploitation of natural resources in the countries they colonized, and modern factors of production continue to widen this inequality. As roughly 75 per cent of total anthropogenic carbon dioxide emissions between 1750 to 2005 can be attributed to developed countries, it is evident that wealthier nations have played a large role in inducing and accelerating

climate change. Efforts made by lower income nations to grow their economies and build prosperous futures could be stagnated by higher temperatures and lower crop yields. Moreover, efforts to develop LMICs through rapid industrialization could be slowed through the prohibition of non-renewable energy and the shift toward more expensive and sustainable methods of energy production.

POVERTY ON THE BACKBURNER

The Sustainable Development Goals (SDGs) set by the United Nations General Assembly were created on the basis of one assumption: time. Providing nations with the tools to meet the needs of the present without undermining the livelihoods of future generations is a challenging task considering resources on this planet are finite and access is often dependent on geographic location. To achieve any development goal with sustainability in mind requires a reorientation of the global economy and a change in the basic, fundamental way that we extract capital – actions that would likely take decades to implement.

Long-term sustainable economic transformation cannot occur overnight, and lack of political action by some of the world's highest emitting nations renders this goal far-

fetched. The concern is that, with the rapid and cumulative nature of climate change effects, important long-term development goals may be put on the backburner to prioritize adaptation to and mitigation of climate catastrophes. In other words, the world will take immediate action to remedy imminent climate threats instead of focusing on long-term poverty alleviation strategies. UN Climate Change Secretariat Koko Warner recently stated that “Sustainable development as we think of it today may be out of reach.” As a result, efforts to address development goals may be reconstructed into simply keeping LMICs afloat long enough to see the storm pass, but not without doing irreparable damage to them first.

SUSTAINABILITY AS AN IMPEDIMENT TO DEVELOPMENT

The pursuance of sustainability as a climate mitigation strategy also slows development progress. Given the current trajectory of how the world views energy sources, LMICs are being asked to continue developing their economies under the GHG limitations set out by the Paris Agreement in November 2016. Restrictions on the same pollutants that made other nations disproportionately rich during the Industrial Revolution impede the ability of LMICs to reach the same level of growth. To that effect, while renewable resources could be used to develop LMIC economies, it would be at a nominal rate. In the face of urgent environmental degradation and the dire need for a strong economy to cope with the crisis, LMICs do not have the time to achieve sustainable growth.

LMICs thus have two choices: either develop at a fast and unsustainable rate, which would equip them with the resources needed to adapt in a climate catastrophe; or, develop at a slower but more sustainable rate, which would yield a lagging economy that prevents the attainment of proper coping strategies for the climate crisis. Either way, LMICs end up on the losing side.

Wealthier countries recognize that LMICs are in this dilemma and have offered financial aid to assist with sustainable development, but to what extent? At the 2009 Climate Summit in Copenhagen, a promise was made by

wealthier nations to mobilize at least \$100 billion USD per year to assist LMICs. However, adaptation measures are predicted to cost well over \$150 billion USD annually. The initial \$100 billion pledge has failed to reach its target each year, but it has been on the rise since its initial instatement in 2009. Other countries such as Mexico are aware of the risk they face and, instead, continue to invest in oil production in order to fuel economic development.

A WAY FORWARD

Poverty reduction tactics must be designed differently to account for climate change. One way forward is a burden-sharing framework, whereby national obligations to act on climate change are calculated by a ‘Responsibility and Capacity’ index for all countries. The Greenhouse Development Rights (GDRs) framework evaluates a country’s contribution to climate change and their financial ability to adapt and determines a country’s obligations to climate action based on their climate ‘debt.’ This framework recognizes the severe disadvantages faced by developing countries and allows for an equal redistribution of the budgeted country-specific financial obligations to address climate change. Familiar examples of this type of framework would be a global cap and trade system or a global emission market. Under both of these systems, income generated could be used to fund countries with less capacity to adapt to climate change. Frameworks such as the GDR are one step forward in protecting the right to development whilst tackling the global climate crisis. While more needs to be done to outline the duties and responsibilities of developed nations, the framework needs to also account for the fact that LMICs will likely soon surpass the richest countries in terms of emission outputs. It is up to policymakers to decide how this burden will be shared, and how developmental goals will be incorporated into climate strategies.



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Round Peg in a Square Hole: Protecting climate migrants outside the refugee regime

BY RACHEL BRYCE | MIGRATION



THERE is a natural inclination to refer to individuals impacted by climate-induced displacement, migration, and relocation as climate refugees. The lives of these individuals, hereafter referred to as “climate migrants,” are uprooted and severely impacted by sudden-onset environmental change or slow-onset environmental degradation. The environment they called home may have disappeared or been altered so severely that life on that land is no longer possible. Such severity often evokes the seriousness and forced nature of refugeeism.

However, “refugee” is a legal term with a specific definition pursuant to the 1951 Convention Relating to the Status of Refugees (“1951 Refugee Convention”), applying to someone with a “well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion.” It is well established that climate migrants cannot fit under this definition, as the environment cannot persecute. Moreover, most climate migration occurs internally, contrary to the 1951 Refugee Convention, which requires refugees to have crossed a border and sought protection from a specific third country, or at the international level through the United Nations High Commissioner for Refugees (UNHCR). The international community must learn how best to meet the needs of this ever-increasing group of people displaced by climate change.

THE DANGERS OF THE TERM “CLIMATE REFUGEE”

The International Organization for Migration (IOM) projects that between 25 million and 1.5 billion people will be forced to leave their homes by 2050 due to climate change and environmental degradation. Dina Ionesco, Head of IOM’s Migration, Environment and Climate Change (MECC) Division, emphasizes that responses to this displacement must be holistic and people-centered to better capture the complexity of human mobility and climate change. She delineates ten aspects missed by reducing climate migration to “climate refugeeism,” including the fact that climate migration occurs largely within states, and fails to fit under classic interpretations of persecution. Ionesco also points out that opening the 1951 Refugee Convention to climate migrants risks weakening refugee status, thus endangering millions more who need protection due to persecution. Gianvito Grieco, an attorney for the Refugee and Immigrant Center for Education and Legal Services (RAICES), explained to Vice:

It’s like a double-edged sword. Do we want to change the law and try to include climate refugees and then risk that some kind of bipartisan compromise would actually scale back the protections that we have today? Or do we just try to find a way to get climate refugees in the framework that we currently have in place?

Here still, Grieco uses the language of “climate refugees.” Although the vulnerability of climate migrants is often perceived at the same level as that of refugees, it is important to understand how migrants and refugees differ and how both groups’ agency should be highlighted.

THINK OUTSIDE THE REFUGEE REGIME

Climate migrants have other pathways to protection that could be strengthened, including migration policies outlined in the Nansen Initiative “toolkit,” which recommends preventive measures to invest in climate solutions, human rights-based approaches that acknowledge and respect the human needs of migrants (i.e. access to services, livelihood provision, policies ensuring dignity), and regular migration pathways. This diversity recognizes the complexity of mobility and climate change and better acknowledges that many climate migrants, or individuals at risk of climate-induced displacement, do not identify as climate refugees. George Benson, a city planner in Vancouver, rightly shares with *Vice* that “it’s hard to advocate for a group that doesn’t even know it exists.” Reporting and policy on the climate-migration nexus should center on dignified and rights-based paths forward that account for the diversity of individuals impacted.

“The international community must learn how best to meet the needs of this ever-increasing group of people displaced by climate change.”

The scale of this issue requires a multi-stakeholder, multi-level response applying existing international human rights frameworks like the International Covenant on Civil and Political Rights (ICCPR), the International Covenant on Economic, Social and Cultural Rights (ICESCR), and regional human rights conventions, while strengthening preventative and protective measures at the local, national, regional, and international levels.

Locally, communities and development partners must continue building resilience to reduce harms associated with climate change, like watershed development for drought-prone areas or flood-resistant cropping. In cities that welcome climate migrants, there could be increased efforts to create opportunities for cyclical employment and housing, better preparing for the regular flows of climate displaced individuals. Emphasizing local action and partnerships with affected communities respects the

agency and dignity of the climate migrants. This leads to stronger, more sustainable, and more representative solutions.

Nationally, migration policies within countries experiencing high levels of climate displacement might include both planned and voluntary relocation of those at risk of displacement, and assistance for internally displaced persons (IDPs) through humanitarian aid, livelihood development, resettlement, integration, or facilitated return. These states also have an important role in the resilience-building activities necessary at the local level.

Regionally and internationally, non-governmental organizations (NGOs), governments, and global civil society should support international efforts to build international and regional protections for climate migrants, and introduce domestic regimes that include climate migrants. Embedding climate migrants into pre-existing international protection regimes, like the Cartagena Declaration on Refugees, would be a good start.

LOOK TO THE SIDS

Pacific small island developing states (SIDS) already have numerous domestic programs to retrain and upskill climate migrants, map risks and vulnerabilities, create dual nationalities, and integrate climate change adaptation and disaster risk reduction. At the regional level, the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) has led the way by introducing the Pacific Climate Change and Migration project in 2013 to determine what national and regional policies could be introduced to fill the gaps in climate change and migration policy. Policy leadership from the SIDS follows naturally from the immediate and direct threat climate change poses to their survival. This leadership should be replicated around the world as the risks of climate change become more salient.



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Scarce Resources and the Security of Extraction

BY KIRA BOLLEN | GLOBAL SECURITY



THIS year's issue of the United Nations Environment Programme's annual report highlights global resource use as a key factor impacting climate change in 2019. The report, which focuses each year on a different cause of the climate crisis, has identified the extraction industry as a top offender. The report shows that resource extraction industries directly contribute to roughly half of global carbon emissions and more than 80 per cent of biodiversity loss worldwide. The report not only describes the detrimental environmental impacts of human consumption patterns, but also indicates that we show no sign of relenting. Natural resource extraction is increasing each year, with demand for resources surpassing population growth rates.

In keeping with this trend, there is little reason to believe that extraction industries will reduce emissions any time soon. As non-renewable energy sources become increasingly scarce, their value will continue to grow along with their demand. Extractive industries inflict not only immense environmental costs but can also generate great security risks in the regions in which they operate. Hence, as natural resource supplies dwindle and competition intensifies, the security of many communities in which extractive industries operate can be jeopardized.

THE RESOURCE SECURITY CURSE

While resource extraction has often been understood as an environmental issue, it has also been a topic of discussion among global security analysts. Richard Auty first coined the term “resource curse” in 1993 to describe the phenomenon of poor economic growth among resource-rich countries. However, the impacts of the resource curse can also be seen in the increased vulnerability of resource-rich communities. Although there is a conceptual debate surrounding the idea of a resource curse, it is hard to ignore the reality that populations living near mineral extraction sites are at an increased risk of violence.

Increased insecurity arising from resource extraction and ownership is attributable to a number of factors. First, as natural resources become increasingly scarce and valuable, competition for access escalates and has the potential to turn violent. This is particularly the case in regions afflicted with existing conflict, where access to lucrative mineral resources can often exacerbate violence. Second, high-value commodities such as oil and precious metals generate significant income for those who control their collection and distribution. For this reason, extraction

PHOTO SOURCE: FLICKR; DAVID BROSSARD

operations are often used by rebel groups, and increasingly by jihadists, as a source of income to fund their operations. The result is a thriving market for conflict minerals, the profits of which fuel lengthy and violent civil wars in many developing states that have the 'misfortune' of being rich in resources. The longer militias are able to fund their operations through resource exploitation, the longer the conflict continues, posing increased risks for the safety and security of local populations.

“Extractive industries inflict not only immense environmental costs but can also generate great security risks in the regions in which they operate.”

IMPORTING INSECURITY

While regional populations are generally more susceptible to resource-related conflict, the effect of resource-fueled violence is not entirely localized. Many mining operations are owned by foreign companies operating in resource-rich countries overseas, such as Canadian mining operations in African states. This territorial buffer separates foreign national mining executives from much of the conflict generated by their resource extraction; however, they are not entirely immune to the security risks their practices generate.

Although foreign companies tend to turn a blind eye to the violence inflicted on vulnerable populations as a result of their mining operations, they are keenly aware of the impact that local conflict can have on their bottom line. Most conflict minerals used by local rebel groups are effective because they can be easily looted and discreetly sold. This makes minerals such as diamonds and gold particularly valuable as their small size makes them easy to pillage, transport, and sell for a high profit. Foreign mining sites are high-value targets for rebel looting, exposing them to great security risks and potentially high financial losses. As a result, mining sites are often highly securitized with large private organizations contracted to provide an intentionally visible and imposing security presence to ward off potential threats.

Unfortunately, precious metals are no longer the only target on mining sites. High profile foreign nationals such as high-ranking company employees are increasingly at risk, as rebel groups seek to profit off of ransom payments for their safe return. Such was the case earlier this year when a Canadian mining executive was captured and killed in Burkina Faso, illuminating a concerning trend of violence against foreigners involved in mining operations and threatening the future of extractive businesses in the region. It is no surprise then that extraction security has become a focal point in recent years as companies strive to protect both their resources and personnel. However, in increasing their own security, companies should be cautious of the implications that an increasingly militarized environment has on the security of local populations. Moves to arm mining operations may serve to lessen the security of the general populace by creating an increased threat through the import of foreign weapons and the presence of unknown foreign security actors.

THE BOTTOM LINE

As key natural resources continue to become even more scarce, the competition to acquire them will become increasingly fierce. The high value of diminishing resources is likely to further exacerbate insecurity in regions where resource density remains high. Where conflict is funded by illegal mineral sales, we may see an increase in activity as groups strive to make the most of their wavering stock. Where conflict is fueled by competition for the acquisition of foreign-owned resources, insecurity is likely to be heightened through violent measures on both sides as looters struggle to obtain possession and companies fight to protect their property and personnel. In either case, the local population will bear the brunt of the costs as their physical security is compromised by increases in extractive activity. Such a situation is truly a race to the bottom, as we continue to use up our waning natural resources while failing to protect those populations most vulnerable to the resource curse of insecurity.



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Who will pay for climate change?

BY MARIA BELENKOVA | INTERNATIONAL LAW



IN the past decades, climate-related disasters have become apparent across the world. In 2018 alone, new temperature records were set in Africa, Asia, and Europe, and heat waves scorched regions from Algeria to the Arctic, engendering forest fires and drought. Meanwhile, severe flooding had devastating impacts on Southern India and Bangladesh while cyclones devastated Fiji. According to the Intergovernmental Panel on Climate Change's 2018 report, impacts of such events include the alteration of ecosystems, disruption of food production and water supply, damage to infrastructure and settlement, morbidity and mortality, and other consequences for human well-being.

In 2018, intense heat waves and wildfires in Europe, Japan, and the U.S. led to over 1,600 deaths and reached a record of \$24 billion USD in damages in the U.S. alone. Meanwhile, in the Philippines, Super Typhoon Mangkhut affected over 2.4 million people, killing at least 134 people. Additionally, the worst flood in nearly a century was experienced in the State of Kerala in India. Considerations of compensatory justice and distributive justice ultimately lead us to ask the question: Who is to be held accountable for the loss and damage caused by climate-related disasters?

THE NEED FOR REPARATION

The obligation to address loss and damages stems from two central principles of customary international law. First, according to the International Court of Justice (ICJ), the no-harm rule requires states to ensure that activities within their jurisdiction or control do not cause damage to the environment of other states or areas beyond the limits of their national jurisdiction. Second, following a breach of the no-harm rule, the law of state responsibility obligates the offending state to cease the act and make full reparation for injury caused (both for material and moral damage) in the form of restitution and/or compensation and satisfactions.

It appears that many developed states have failed to take proportionate measures to prevent damage resulting from domestic greenhouse gas (GHG) emissions and the consequent effect of increasing atmospheric concentrations of carbon dioxide, which were known to cause damage to the environment of other states. However, the multiplicity of actors and activities accumulating and resulting in harm over a long period of time complicates the application of the no-harm rule to climate change. The ICJ has provided no clarification on the scope of this principle.

THE CURRENT SYSTEM

In 1991, during the drafting of the United Nations Framework Convention on Climate Change (UNFCCC), the Alliance of Small Island States first stressed the need to address loss and damages caused by climate change for vulnerable parties. In the context of rising sea levels, it suggested the creation of an international insurance pool as a collective loss-sharing scheme to compensate victims. This would be funded by mandatory contributions from industrialised countries based on their ability to pay according to gross national product, and their responsibility reflected by relative GHG emissions.

PHOTO SOURCE: FLICKR, UNITED NATIONS

It was only much later at the UNFCCC's 19th Conference of the Parties in 2013 that a constitutional arrangement for loss and damages, known as the Warsaw International Mechanism for Loss and Damage associated with Climate Change Impacts (WIM), was created. According to the UNFCCC, the general function of WIM is to address loss and damage associated with the impacts of climate change, including extreme events and slow onset events, in developing countries that are particularly vulnerable to the adverse effects of climate change.

FALLING BEHIND

Although the Paris Agreement endorsed WIM in 2015, the mechanism is highly debated, and its implications remain largely unclear. In 2014, UNFCCC parties adopted a two-year plan for the WIM Executive Committee (ExCom). The plan received much criticism for focusing primarily on the gathering of knowledge and the coordination of stakeholders, while neglecting the enhancement of action and support, including its financing. While it identified some approaches to financing loss and damages, these were found to be problematic as they failed to address the various impacts of climate change. The following five-year workplan, adopted in 2017, revealed a similar approach by including a strategic work stream on enhanced cooperation and facilitation instead of considering new sources of finance.

Further discussions of loss and damage, addressing finance options, were postponed to an expert dialogue in 2018, aimed at the 2019 review of WIM. Parties have voiced the need for financial support to effectively prevent and address loss and damage. Importantly, there lacks a consistent assessment of loss and damage costs, as estimates range from \$400 billion USD per year by 2030 to \$4 trillion USD per year.

IMPLEMENTATION CHALLENGES

The current climate regime has been largely operating according to the principle of common but differentiated responsibilities. This principle recognizes that climate change affects and is caused by all nations, and that the resulting responsibilities ought to be differentiated because not all nations should contribute equally to alleviate the problem. While some Western states have

accepted responsibility as wealthy states, they have not admitted to a causal responsibility as industrial states, showing inconsistency with the no-harm principle of international law.

Instead of creating a strict regime of rights and obligations, this has led to spontaneous State initiatives, such as voluntary funding. For example, the German Federal Ministry of Economic Cooperation and Development (BMZ) funds the InsurResilience Investment Fund, which invests in partner countries' insurance providers, such as Caja Sullana in Peru which offers insurance against flood and drought to small farmers and businesses to help rebuild their destroyed assets. As seen in WIM ExCom's two-year workplan, most of the financing mechanisms offered are insurance schemes subsidized with voluntary contributions. With developed states showing opposition to restorative obligations and additional financial instruments in the context of WIM, it becomes difficult to conceptualize a comprehensive framework of restitution.

LONG ROAD AHEAD

Important steps have been taken towards the recognition of the importance of loss and damage in the context of climate change. However, the opposition of powerful states to the application of the no-harm principle reinforces the use of international law as a tool of domination and erodes the trust in international law as an instrument of global justice.

A reliable and effective scheme of loss and damages funding, which would create incentives to encourage compliance, is necessary to protect vulnerable countries against the effects of climate change. The international community must continue to move forward by holding major-emitting countries accountable for the damage they cause.



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“Climate Apartheid:” Are human rights equipped for the challenge?

BY KRISTEN KEPHALAS | HUMAN RIGHTS



IN June 2019, the UN Special Rapporteur on extreme poverty and human rights, Phillip Alston, stated that tens of millions of people will remain in poverty even if current climate targets are met. He also warned that climate change could push an additional 120 million people into poverty by 2030, with the greatest impacts in developing countries. According to the Special Rapporteur, millions of people will eventually have to choose between starvation and migration.

However, not everyone will be forced to make this choice. In addition to being an environmental issue, climate change poses a serious human rights challenge. The Rapporteur predicts that we will experience a “climate apartheid” where the wealthy will continue to escape increasing hunger, conflict, and natural disasters, while everyone else suffers the full effects.

IS “CLIMATE APARTHEID” IMMINENT ?

Alston’s report claims that climate change “threatens to undo the last 50 years of progress in development, global health, and poverty reduction,” with low- and middle-income countries bearing approximately 75 per cent of the cost. This is despite the fact that the poorest half of the world’s population is responsible for only ten per cent of carbon dioxide emissions. In a 2017 interview with Democracy Now! at the United Nations Climate Conference in Bonn, Germany, South African climate activist Kumi Naidoo aptly stated, “finding a climate solution is about valuing human life in an equal way across the planet.”

The Special Rapporteur’s report forewarns the future impact that climate change will have on the attainment of universal human rights. However, the marked divide in the way that natural disasters are felt by the poor suggests that we are already entering a climate apartheid. As the impact and frequency of natural disasters intensify due to climate change, the fallout has become starkly income-divided between the Global North and South.

In low-income countries, residents are six times more likely to be injured, lose their homes, be displaced, and require emergency services in the event of a climate disaster than those living in high-income countries. Moreover, the climate change class divide is not limited to low- and middle-income countries. The 2018 Woolsey fire in Malibu, California drew headlines more for how the destruction was dispersed rather than the destruction itself. Of the 96,000 acres of land that were burned in Malibu, only one structure in the elite Hidden Hills enclave was destroyed – a barn. Similarly, the Special Rapporteur cites the example of Hurricane Sandy, which hit New York state in 2012. At the height of the storm, Wall Street investment bank Goldman Sachs was protected by tens of thousands of sandbags and maintained electrical power sourced from its own generator. Conversely, low-income residents were left stranded without power and access to immediate healthcare.

THE INTERNATIONAL HUMAN RIGHTS FRAMEWORK OF CLIMATE CHANGE

The disparate impacts of climate change are ostensibly human rights issues. Human rights frameworks such as the International Covenant on Economic, Social and Cultural Rights (ICESCR), the Universal Declaration of Human Rights (UDHR), and the Convention on the Rights of the Child (CRC) include provisions that confer the right to an adequate standard of living. This means that all individuals are entitled to necessities such as food, clothing, housing, medical care, and social services. Article 27.1 of the CRC sets a higher bar for fulfilling this right by specifying that a child’s standard of living should

PHOTO SOURCE: FLICKR, JERVIS SUNDAYS

be adequate for their “physical, mental, spiritual, moral and social development.”

Under climate apartheid, these rights are violated most egregiously for the poor who often spend months, or even years, without basic necessities in the aftermath of a climate disaster. They also bear the burden of hunger and disease that is exacerbated by climate events such as increased precipitation, drought, and rising temperatures. Beyond the right to an adequate standard of living, climate change also affects other human rights, such as the right to migration and, in the case of environmental activists, protection from extrajudicial violence.

So, how do international human rights frameworks measure up to this threat? According to the Special Rapporteur, poorly. Although Alston issued forward-looking statements, human rights bodies are already failing the world’s most vulnerable. As parties to human rights conventions, states have an obligation to take reasonable measures to protect these rights, but they have not been fulfilling their duty.

HOW ARE HUMAN RIGHTS FRAMEWORKS FALLING SHORT ?

There are a number of reasons for the inadequacy of the global human rights system when it comes to climate change. For one, there are no international human rights that address environmental issues. The only exceptions are found in the CRC: Article 24 obliges States to “take into consideration the dangers and risks of environmental pollution” when combatting disease and malnutrition; and, Article 29 provides that education should include a development of respect for the environment. Instead, climate-related human rights violations are slotted into a variety of rights across different frameworks that only partially cover the extent of the suffering. While over a hundred countries have a nationally enshrined right to a healthy environment, legislation ranges in comprehensiveness and enforceability.

Human rights-adjacent frameworks also fail to adequately address environmental threats. For example, the 1951 UN Refugee Convention does not offer any protection to those who are displaced due to climate change. Climate migrants are often mischaracterized as economic migrants, entitled to few or no protections, and are even

received with hostility. Without a substantive international right to the environment, climate-related rights violations will either fall through the legal cracks or be left to the behest of national governments.

In addition to the gap in substantive rights, the existing human rights framework lacks enforceability. There is no legal recourse mechanism at the international level for individual human rights violations, meaning that violations at the state level are rampant. There are also distinct racial and socioeconomic components to these violations, with Indigenous peoples, ethnic minorities, and low-income populations being disproportionately impacted. Often, it is not that states are deliberately failing their populations, but rather they are failing to act at all. For example, climate activists in Latin America have endured violence for decades with little intervention by the state. In November 2019, Paulo Paulino Guajajara, a well-known Brazilian environmental activist, was murdered by illegal loggers on Indigenous land. The region is frequently targeted despite being “protected” by the government. When states blatantly violate human rights obligations, they do so with impunity. These violations are not only committed in developing countries. In the United States, the 2016 climate protests against the construction of a pipeline through Indigenous land at Standing Rock First Nation Reserve in North Dakota were met with extreme police violence.

Climate apartheid has already begun to take root. A combination of structural failures leaves the current framework ill-equipped to tackle the human rights challenges of climate change. This failure highlights the intersectional nature of climate change, since those with the least institutional power experience the most significant violations to their rights. As the Special Rapporteur states, “the usual piecemeal, issue-by-issue human rights methodology is woefully insufficient.” The human rights effects of climate change will only worsen as the crisis intensifies. The existing human rights framework will require immediate reform on a global scale if it intends to catch up.



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The Rise of Ecofeminism: How climate change and gender inequality go hand in hand

BY EMILY GREISS | GENDER & IDENTITY POLITICS



IN her Special Address at the Annual Meeting of the World Economic Forum in January 2019, Swedish student activist Greta Thunberg urged transformational climate action by exclaiming “Our house is on fire.” Disproportionately, the metaphorical house that Thunberg is referring to pertains to that of rural women in developing countries. The consequences of natural disasters, droughts, and other climate-related crises in developing nations are most acutely felt by the population’s women due to existing inequalities and gender roles. As a result, women are driven to play a significant role in mitigation and adaptation efforts in response to the effects of climate change in their communities.

The mutually reinforcing effects of ecological and gender oppression — whereby environmental degradation is related to the exploitation and disempowerment of women — has underpinned the emergence of ‘ecofeminism’ in the 1970s. This theoretical perspective postulates that empowering women is central to achieving progress on climate action. Moving forward, greater female political representation and a more equalized playing field will yield substantive progress for climate action.

CLIMATE INEQUALITY

The majority of the world’s population living in poverty are women. Globally, there are 122 young women living in extreme poverty for every 100 men. Gender roles are often divided such that women are responsible for resource-based tasks such as preparing food, collecting water, gathering firewood, and sourcing cooking fuel in addition to meeting other household needs, including childcare. Women suffer disproportionately from the impact of climate change on resource availability in low-income countries; however, they have fewer rights to land, resources, and government support. For example, female farmers account for nearly half of the world’s smallholder farmers and 45 to 80 per cent of all food production in low-income countries, yet less than 20 per cent of land worldwide is owned by women.

Extreme weather events such as droughts, floods, wildfires, and natural disasters have historically disproportionately impacted the most impoverished and vulnerable subgroups, including women. Due to a worsening shortage of resources, women and girls are more likely to be married at a young age or taken out of school as families look to cash in dowries or require girls to stay at home and complete increasingly challenging household duties, such as collecting water. In effect, this entrenches existing inequalities by eliminating opportunities for girls’ skills development, decision-making, and autonomy. Additionally, in nations such as South Sudan and India, droughts and flooding force women to walk further for essential resources like firewood and water. As a result, they are exposed to dangerous circumstances and health conditions, including sexual violence, malaria, and malnutrition.

In the event of natural disasters, men are up to 14 times more likely to survive than women and children. His-

torical examples of these survival rates include the 2004 tsunami in Southeast Asia where surviving men in India, Indonesia, and Sri Lanka outnumbered surviving women four-fold. Oxfam reported that the disproportionate death tolls were likely a result of women staying behind to look for their children and other relatives as well as cultural gender roles that bring women closer to the sea-front, compounded by a lower physical ability to escape. A similar pattern emerged following the 2014 Solomon Island floods where 96 per cent of fatalities were women and children. There is also a negative relationship between women's risk of being killed during natural disasters and their socio-economic status, including their access to information, economic resources, and autonomy. The resulting imbalance in male-to-female survival ratios has further implications for overcrowded resettlement sites where women are exposed to greater risks of human trafficking, gender-based violence, and domestic abuse.

THE WATER & SOLAR “SAHELIS”

Along with evidence of women's heightened exposure to the effects of climate change, there are also trends of women actively engaging in climate action. More than 200 villages of the Bundelkhand region in north-central India are home to “Jal Sahelis,” which translates from Hindi to “water friends.” Jal Sahelis are groups of up to three female community leaders who are taking the lead on adapting to the effects of climate change on water scarcity in their localities. Jal Sahelis play a critical role in adapting to the consequences of droughts and water shortages by harvesting rainwater, digging wells, building dams, and repairing hand pumps. As a result of these efforts, their villages continue to experience better irrigation, healthier crop harvests, increased drinking water, and shorter walks to obtain water.

Similarly, the northwestern Indian state of Rajasthan is home to roughly 2,500 “Solar Sahelis,” or solar women, who promote the use of solar power in neighbouring villages to power homes with clean energy. These efforts are central to mitigating the harmful effects of pollution emitted from regular electrical sources as well as providing more reliable access to electricity in a region that is prone to daily power cuts lasting for hours at a time. Spearheaded by a social enterprise called “Frontier Markets,” this initiative also empowers women with greater

economic independence in a largely patriarchal community where girls are often subjected to child marriage, denied education, and forced to work in the home. As a result of this project, it is reported that 750,000 tonnes of carbon emissions have been avoided, 14,000 child marriages have been prevented due to investments in girls' education, and the Solar Sahelis have collectively earned over \$2.5 million USD of income by delivering electricity to over 500,000 homes.

GENDER-TRANSFORMATIVE CLIMATE ADAPTATION

Since it is statistically known that women and girls are more vulnerable to many consequences of climate change such as resource scarcity and natural disasters, greater gender inclusion is critical to driving forward transformative climate action. By and large, women are often an untapped resource, despite their breadth of knowledge regarding adaptive and mitigative requirements to changing environmental circumstances.

In 2019, climate activism — including strikes, campaigns, and policy reform — is on the rise internationally, bolstered by the efforts of young women like Greta Thunberg, Alexandria Ocasio-Cortez, and Autumn Peltier. Notably, Peltier is a teenage activist driving forward the fight to protect water in Canada's Indigenous communities. She credits her passion for the cause to Indigenous cultural teachings where “One learns to love water as they love their mother” and to her traditional role as a water carrier inherited from her female ancestors.

While the future of climate action is uncertain, a more sustainable course of action is one that represents the interests of those most vulnerable to the effects of environmental degradation and embraces policies that promote gender equality. This path forward is not only best for society, but for our planet.



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More than Victims: How Indigenous communities globally are tackling climate change

BY FIONA CASHELL | INDIGENOUS AFFAIRS



NATURE has always been symbolic to Indigenous populations around the world. Not just a source of nourishment or economic opportunities, the connection to the environment has deep spiritual roots for Indigenous peoples. It has been widely reported that climate change will disproportionately impact low-income and marginalized communities, including Indigenous peoples who represent five per cent of the global population. However, rather than being passive victims, Indigenous leaders and communities have been active players in the fight against climate change.

A UNIQUE ROLE TO PLAY

Indigenous peoples live on approximately 22 per cent of the planet's land surface – land which holds 80 per cent of the world's biodiversity. The expansive variety of territories that Indigenous peoples inhabit present both opportunities for conservation and risks to their livelihoods in light of climate change. Communities situated on coastlines, in mountain ranges, and in the Arctic will all feel the impact of climate change in a greater capacity. It is therefore necessary to engage with Indigenous

populations in order for climate action to be effective.

TRADITIONAL KNOWLEDGE

Generational knowledge held by Indigenous groups has been used to track and mitigate the impacts of climate change. Indigenous communities in Peru have proven their ability to adapt to climate variance, growing hundreds of varieties of potatoes. This seemingly small act of farming ensures that they will not have a food crisis due to climate impacts, as opposed to societies that depend on a singular crop.

In addition to sharing knowledge, Indigenous inventions are also being used to offset the climate crisis. For example, communities in Southeast Asia have traditionally used banana leaves for bowls, cooking, and preserving food. Their characteristics of flexibility and being waterproof has led to them being used in grocery stores in place of plastic bags for produce in Thailand.

PHOTO SOURCE: FLICKR, BROOKE ANDERSON

LAND OWNERSHIP: AN OPPORTUNITY FOR CHANGE

Many Indigenous communities around the world do not own rights to the land upon which they live. The Intergovernmental Panel on Climate Change (IPCC) argued in their Climate Change and Land report that “insecure land tenure affects the ability of people, communities and organizations to make changes to land that can advance adaptation and mitigation.”

This lack of land control has led to past injustices against Indigenous peoples, even in the fight against climate change. One such example is Reducing Emissions from Deforestation and Forest Degradation (REDD+) initiative, which aims to reduce deforestation through offering financial incentives to curb carbon emissions in developing countries’ forests. Conflict arose, however, when countries who had violated the right to Free, Prior and Informed Consent under the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) began participating in the program. As a result, Indigenous activists feared that communities who rely on forest resources would lose control of their land.

Research indicates that Indigenous communities adopt a relatively conservationist approach to land management. A recent study by World Resources Institute (WRI) and the InterAmerican Development Bank focussing on Indigenous communities in Bolivia, Brazil, and Colombia demonstrates that deforestation rates are significantly lower in tenure-secured land – two to three times lower than in similar lands not managed by Indigenous peoples.

DIVERGING VOICES

It is important to note that not all Indigenous peoples agree on how climate change should be mitigated, and how their communities can be empowered by climate action. This dissent is illustrated by the case of the Trans Mountain Pipeline in Canada. One of the most important groups in this debate is The Western Indigenous Pipeline Group, a coalition of Indigenous communities located alongside the Trans Mountain Pipeline. The group is seeking a 51 per cent share in the project, with a goal to make economic gains that support the independence

of their communities. Member Chief Mike LeBourdais argued in an interview with APTN News that pipelines would reduce negative effects on the environment, and be more environmentally friendly than transporting oil on the road or by rail. This is all to say that climate change policy is perceived differently by different groups, therefore no one voice or action can represent the global Indigenous community.

Despite differing views and policy approaches, rather than waiting for policy change to take place, Indigenous peoples have been actively engaged in the push for stronger climate action. Fifteen-year-old Autumn Peltier of Wiikwemkoong First Nation on Manitoulin Island has spoken twice at the United Nations on water protection. At her most recent appearance on September 28, she said to the forum, “I’ve said it once, and I’ll say it again, we can’t eat money, or drink oil.” Her work, along with Indigenous youth who participate in climate protests, continues to push the climate crisis to the forefront for policy makers.

A SHARED JOURNEY

It is imperative for Indigenous voices to be actively included in the international climate discourse, and they must be consulted in both the development and implementation of climate policies. Indigenous communities should not be viewed as mere victims of climate change, and it is through their engagement in the climate discourse that any global approach to mitigating this crisis will ever have the chance of succeeding. We must also acknowledge the multiplicity of Indigenous voices. A good start to promoting real change would be to incorporate Indigenous knowledge as a complement, rather than a barrier, to Western science. The climate crisis will impact the entire planet, but it is important to prioritize those voices which are closely tied to the land that we all have an obligation to protect.



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How to Think about Climate Change: The Canadian way

BY JESSE MARTIN | CANADA IN THE WORLD



CANADA'S recent federal election put humanity's most existential threat – climate change – to a referendum. Canadians resoundingly chose to take action on climate issues, and 63 per cent of voters cast a ballot for a party that supported a carbon tax. This is a policy that for most political parties, regardless of the country, would surely sound its defeat. Canadians have proven that climate change denial can be overcome, and real policies to fight climate change can win votes. The Liberal Party won another mandate to govern and push for a carbon tax, but how did they do it?

The greatest challenge in fighting climate change has been convincing people that instituting costly measures now will yield future payoffs. Few countries that legislated a carbon tax managed to maintain it after an election. Australia implemented a carbon tax for just two years before it was repealed. Carbon taxes have also been implemented in South Africa and Chile after long delays, but political instability in these countries makes it unlikely for the carbon tax to survive the next election. While the E.U. and California implemented cap and trade emissions systems, these policies are more modest and potentially less effective at reducing carbon emissions. Fundamentally,

the inability for political parties to gain long-term, broad support for climate action can be explained by psychology.

PSYCHOLOGY AND CLIMATE CHANGE

The psychological barrier to resolving climate change boils down to cognitive dissonance and hyperbolic discounting. Both of these effects reduce individuals' abilities to clearly evaluate the costs of climate change. Bill Nye summarizes cognitive dissonance well, stating "people have a certain worldview; [then] they're confronted with evidence that conflicts with the worldview, so... instead of changing your worldview, you dismiss the evidence." Hyperbolic discounting on the other hand is an involuntary perception which hampers individuals' ability to consider the distant, catastrophic nature of climate change. Because of hyperbolic discounting, individuals underestimate the effects of climate change despite its high costs both now and in the future.

In this sense, people's experience with climate change is like that of a frog swimming in a slowly warming pot of water. The frog does not realize the warming water until

it is too late, and the frog dies. Climate change is experienced through heat waves, rising sea levels, and worsening natural disasters. Yet, like slowly warming water, experiencing an extra few days over 40 degrees Celsius, the oceans rising by 3.2 millimeters, or slightly worse flooding than the previous year is not easily linked to climate change when considered in isolation. This lack of awareness is a particular problem in wealthy countries that have better infrastructure, early-warning systems, and programs that reduce the explicit visibility of these issues.

“The greatest challenge in fighting climate change has been convincing people that instituting costly measures now will yield future payoffs.”

CANADA’S PLAN

There are two reasons for the survival of the carbon tax and evidence-based climate policies in Canada. Firstly, the carbon tax rebate policy, as part of the Greenhouse Gas Pricing Act, makes the carbon tax more of a carbon dividend, thereby offsetting the effect of hyperbolic discounting by providing tangible current benefits. Over 70 per cent of Canadians receive more from the rebate, given that they file for it, than they pay in additional taxes on gas and heat. This results from the government’s commitment to keep the policy revenue neutral. This makes the carbon tax one of the most economically efficient methods for addressing climate change. This rebate resolved much of the perceived cost of the carbon tax for Canadians.

Secondly, the ideology underpinning attitudes toward climate change is more difficult to overcome because of its connections to individuals’ values and culture. Whereas the dividend effect of the Canadian carbon rebate resolves much of the hyperbolic discounting, cognitive dissonance still exists. In response to this, the Liberals, the left, and the climate change movement have changed Canadians’ minds, so action on climate change through

the carbon tax was no longer a challenging proposition.

The combination of the Liberal Party keeping the carbon tax at the forefront of their platform and the Conservative Party’s avoidance of an evidence-based climate policy was a significant factor in turning the federal election into a referendum on climate action. All left-of-centre political parties adopted real climate change policies which motivated left-leaning Canadians to fully support the carbon tax. This shifted the prevailing discourse in favour of progressive climate change policy, and the impetus for climate action became a key determinant of the election.

However, national politics is not the only cause of the shift in Canadians’ attitude on climate change. The global climate movement has also played a significant role. Since 2015, there has been a dramatic increase in awareness and understanding of the urgency of climate change. This included the publication of the Intergovernmental Panel on Climate Change’s report that set warming limits of 1.5 and two degrees Celsius above industrial-era average global temperatures, and activist Greta Thunberg’s recent tour of Canada. The tour and climate marches, occurring just prior to the general election, were perhaps the most vivid illustration of how Canadians overcame psychological barriers and became overwhelmingly open to the global climate movement.

LOOKING FORWARD

Other political parties looking to champion climate action can learn from Canada. To successfully implement a carbon tax, crafting innovative policy that gives back to the people and focusing on climate change as a core platform issue is critical. The influence of the global climate change movement suggests that political parties around the world will increasingly turn to climate policy for electoral success. Fortunately, they can look to Canada as an example.



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Going Green(er): Climate Action and the European Investment Bank

BY RACHAEL WEBB | EUROPEAN AFFAIRS



On October 15, 2019, climate activists and energy producers held their breath for the European Investment Bank (EIB) to announce its decision on a controversial proposal to stop funding fossil fuel projects by the end of 2020. Hesitation by a small group of countries postponed the final decision until the next board meeting on November 14th. Neither supporters nor detractors of the bill were pleased with the delay as the future of green financing would remain in limbo.

IN THE GREEN

As the European Union's bank and the world's largest multilateral borrower and lender, the EIB is made up of two main entities: the European Investment Bank and the European Investment Fund. Its board is mostly comprised of E.U. Member State Finance Ministers whose votes are weighted based on monetary contributions to the Bank.

Since its creation by the Treaty of Rome in 1957, the EIB has steadily increased its energy sector investments. The Bank is one of the most prominent providers of climate finance and has contributed more than €65 billion

to green energy projects since 2014. In 2007, the Bank created Climate Awareness Bonds, also known as Green Bonds, to fund energy efficiency and renewable energy projects. Issued bonds are expected to reach \$250 billion USD in 2019.

Climate and environment is one of the EIB's four main funding targets, committing a quarter of its total financing to climate change adaptation and mitigation. Some European leaders have called for the EIB to be even more deeply involved in environmental issues, including a proposal by French President Emmanuel Macron to shift its mandate to be completely climate-oriented. The President-elect of the European Commission, Ursula von der Leyen, also indicated that this option was being considered, although there is no plan on implementing the transition.

Despite its reputation as a climate trend-setter, the EIB was brought to court over a controversial funding decision in early 2019. Environmental advocacy group ClientEarth brought the EIB to the E.U. General Court over financing the construction of a biomass power plant in Spain. The advocacy group maintains that the Bank had not properly assessed the environmental impact of

the plant. The E.U. General Court denied the case, leading to an European Court of Justice (ECJ) appeal by ClientEarth.

SEEKING THE GREENER GRASS

Reflecting the growing importance of climate politics within the E.U., the EIB has steadily increased its involvement in renewable energy projects across the continent and abroad. Despite the Bank's financial support of E.U. environmental goals and commitments, the recent ClientEarth case has highlighted inconsistencies in the EIB's funding strategies and has raised questions of how green the institution really is.

To clarify its role and position on climate-based lending policies, the EIB drafted a new version of its Energy Lending Criteria in the summer of 2019. The goal of the Criteria is to support both the E.U. and its individual Member States in meeting the 2030 decarbonization targets under the Paris Agreement. The EIB would focus on creating long-term market incentives to achieve climate limits and find ways to stimulate the greater market where investment is lacking, such as innovative energy technology.

The proposed Criteria sets out four priorities for the energy sector across the E.U. These include increasing energy efficiency with projects such as retrofitting inefficient buildings, decarbonizing the energy supply by supporting renewable power in the E.U., and supporting innovative technologies to build infrastructure that enables clean energy such as efficient power grids.

Although financing along these four priorities may promote more efficient energy development in the years to come, this alone is unlikely to be enough for the E.U. to reach its Paris targets. To close this gap, the EIB made its most controversial proposal: phasing out all investment related to fossil fuels by the end of 2020. This would include a halt on financing oil and gas production, coal mining, oil, coal, and natural gas infrastructure, and power and heat generation from fossil fuel sources. This is not an insignificant proposal, as the EIB has invested €13.4 billion in fossil fuel projects since 2013, with two billion euros in 2018 alone.

GETTING A GREEN LIGHT

Since the Paris Agreement, some big commercial banks have increased investment in fossil fuel industries to compensate for lower state investment, but many public interest organizations are calling for an end to this practice. As a result, several private sector financial groups have begun quietly divesting themselves from fossil fuels. According to many climate activists, the phase-out of fossil fuels is an obvious step for the EIB. If the EIB follows through with the proposed new criteria, it will be the first multilateral bank to remove fossil fuel projects from its portfolio. Such a significant financing blow would likely cause havoc in fossil fuel industries, with the construction of new infrastructure and projects becoming increasingly difficult as less money rolls in.

Not everyone is on board with the decision to divest. Representatives from Germany, Italy, Poland, and Latvia all voiced reservations on the proposal during and leading up to the EIB board meeting on October 15. Their concerns centre on the elimination of funding for natural gas projects, which are seen as transition technologies for oil- and coal-heavy states. Although the Energy Lending Criteria proposal maintains that the EIB will financially support those countries facing significant energy infrastructure changes, the more reluctant European states worry that halting funding for all fossil fuel projects would mean a return to readily available coal infrastructure to avoid economic shock.

After months of deliberation, many high-level EIB officials are now celebrating the institution's turn to greener pastures. At the November 14 meeting, members of the EIB Board officially decided to end funding for oil, coal, and fossil fuel projects by the end of 2021 in an effort to fully align with European commitments under the Paris Accord. As the EIB makes this transition, observers await the impact of this decision on the E.U. economy and the environment.



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Rain-Fed Agriculture: Can we do more with less?

BY JOANNA SHORT | SUB-SAHARAN AFRICAN AFFAIRS



DEVELOPED and developing nations experience the climate crisis very differently. Many people living in developed countries refuse to change consumption habits, whilst failing to consider the massive implications of climate change in developing countries. Sub-Saharan Africa (SSA) is one of the most vulnerable regions to the impacts of global climate change. This is largely due to the region's reliance on rain-fed agriculture, which is highly sensitive to changes in temperature, precipitation, and extreme weather events. This dependency, coupled with the region's low capacity for mitigation and adaptation, creates a serious concern for long-term regional stability.

CLIMATE CHANGE IN SSA

Due to its size, SSA experiences warming effects differently than other regions. It has a wide variety of climate zones, from tropical biomes to arid deserts, each requiring unique mitigation and adaptation strategies. If the average global temperature increase reaches two degrees Celsius there will be significant changes in the occurrence and intensity of temperature extremes across the entire sub-Saharan region. As a result, East Africa will be exposed to higher risks of flooding and infrastructure damage. Likewise, West Africa is projected to experience

severe impacts on food production, thereby creating severe risks for food security and negative repercussions for human health and employment. South Africa will see the strongest decrease in precipitation causing increased risks of drought. Moreover, rising sea levels combined with population growth forecasts put an increasing number of densely populated coastal cities at risk, thereby increasing the likelihood of large-scale migration.

WHAT'S THE CONCERN ?

Agriculture in Africa has a massive social and economic footprint. More than 60 per cent of the population of SSA are smallholder farmers, and about 23 per cent of SSA's total GDP comes from agriculture. Disruption to this sector is having detrimental consequences, which will only be exacerbated as temperatures continue to rise and weather patterns continue to change.

Rainfall and water scarcity are the largest concerns for the region as they have already immensely impacted the livelihoods of the population, much of which lives below the poverty line. Rainfall has regularly been below average, with 2011 being the driest year since 1951. Decreasing rainfall is a serious problem for a continent that is almost entirely dependent on rain for its agriculture. However, a lack of water is not the only issue, as extreme weather events with intense concentrated precipitation can cause dramatic floods that can wipe out an entire crop yield in less than a day.

SSA is a rapidly developing region and by 2050, its population is projected to approach two billion people. Climate change impacts on agriculture are expected to undermine human health by affecting the affordability and availability of nutritious food, among other things. Approximately one in four people in SSA are currently undernourished, amounting to a quarter of the world's undernourished people. Projections indicate that with global warming of 1.2 to 1.7 degrees Celsius by 2050,

PHOTO SOURCE: FLICKR, JOHN WAMBUGU

the proportion of the population that is undernourished will increase to somewhere between 25 to 90 per cent. Drought also affects power generation in a number of SSA countries, especially when the dam levels fall below the threshold for generating hydroelectric power.

FAILING LONG-TERM MITIGATION AND ADAPTION PLANNING

Given that 60 per cent of people work in the agriculture sector in SSA, the fact that 96 per cent of overall crop production is rain-fed is cause for alarm. Across SSA, yield potential exceeds what is actually achieved, with inadequate water and nutrients being the major limiting factors. This means missed opportunities for GDP growth and a riskier investment climate for those looking to enter the market. Historically, changing precipitation patterns have been hard to measure in SSA due to poor monitoring infrastructure. Alarmingly, less than four per cent of farmland in SSA is irrigated. This means that in order to adapt to the changing climate, solutions will need to enhance the rainfed agricultural model through innovation. Although there is much discussion at the continental and regional levels about mitigation and adaption planning, there is a disconnect between those conversations and national action.

STRATEGIES TO MITIGATE AND ADAPT

Rain-fed agriculture will remain the dominant source of staple food production and support for the livelihood of the majority of SSA's rural population. Failure to incorporate traditional context-specific issues is also a concern when designing policy in this region. Greatly enhanced investment in agriculture by a broad range of stakeholders will be required if this sector is to meet the food security requirements of tomorrow's Africa. What is clear is that a move away from rainfed agriculture in SSA is likely unachievable. In systems reliant on rainfall as the sole source of moisture for crop or pasture growth, seasonal rainfall variability is inevitably seen through both highly variable production levels and individual farmer mitigation strategies. Such strategies can be broadly grouped into three categories. The first is pre-emptive risk-management options, such as planting risk-tolerant crop varieties, investing in water management, and diversifying farming and

other associated livelihood enterprises prior to the onset of the season. The second is in-season adjustment in response to specific climatic shocks as they evolve. Finally, risk management options such as insurances and borrowing strategies may be used to minimize impacts of adverse climatic shocks on livelihood, where available.

Only five per cent of public agricultural water investments support rain-fed agriculture. Scaling up enhanced rainfed agriculture will require a significant investment, but there is a clear value proposition in making this happen. One promising option is an investment in greenwater technology. Greenwater refers to water derived from rainfall that is available in the soil for uptake by plants through transpiration. Capturing and storing this water could be the key to supporting rain-fed agriculture, as not all rainfall is needed immediately by plants. The estimated cost of greenwater management in rainfed smallholder farming is only \$250-\$500 USD per hectare, a cost-effective water solution which promises sustainable increase in productivity through multiple knock-on effects. Greenwater capture and storage are critical for increasing the availability of greenwater for plant growth. Water capture increases water availability by reducing rainwater runoff and groundwater seepage, through efforts such as ponding and the use of small dams. This option should further be explored by policymakers to ensure timely adaption to unreliable weather patterns.

INVESTING IN WATER IS KEY

Climate change is considered a threat multiplier, with the potential to exacerbate existing issues, including conflict, food security, and migration patterns. Water, if not managed properly and mitigated to the best of our abilities, may be the single biggest cause of conflict in Africa in the next 25 years. Therefore, it is integral that investments are made to ensure water is sourced and managed effectively throughout the region.



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How can Japan improve their disaster risk management practices in the advent of the climate crisis?

BY JASMINE WRIGHT | ASIA-PACIFIC AFFAIRS



TYPHOON Hagibis made landfall in Japan this fall, hitting the island state hard from October 4 to 20. Japan's Cabinet declared it was a severe and extraordinary natural disaster, killing 88 people with seven still missing. Its impact on infrastructure was profound; levees caved in at 140 points across 71 rivers in seven prefectures and 281 rivers flooded. As the storm dissipated from Tokyo, torrential rain fell in Fukushima Prefecture, raising alarm about potential radioactive contamination in flooded areas from the aftermath of the 2011 Fukushima Daiichi nuclear disaster.

Due to its geographic location Japan experiences many natural disasters, expecting anywhere from five to six typhoons per year. However, Japan also has some of the best disaster risk management (DRM) practices in the world, which makes the high death toll and billions of dollars in infrastructure damage caused by Typhoon Hagibis difficult to comprehend.

Climate change studies indicate that there is a high chance that Japan will experience more frequent and stronger ty-

phoons in the future due to increasing sea temperatures as a consequence of global warming. Tropical cyclones in the Northwest Pacific Ocean Basin are intensifying and reaching farther north, partially due to the climate crisis. The increasing severity of typhoons due to climate change coincides with increasing damage costs. Indeed, four of Japan's most expensive typhoons, including Typhoon Hagibis, have taken place since 2018.

Therefore, with natural disasters intensifying due to the climate crisis and Japan's inability to cope with these increasingly powerful storms, are Japan's DRM practices becoming ineffective?

JAPAN'S DRM AND CLIMATE CHANGE: A LACK OF STRATEGIC FORESIGHT

According to an academic study published in July 2019, the Government of Japan's DRM recommendations have not accounted for the future scenario in which natural disasters such as tsunamis or typhoons are worsened due

PHOTO SOURCE: AUTHOR

to the effects of climate change. The government has not mentioned the heightened risks posed by the effects of climate change on natural disasters, despite scientific evidence indicating that rising sea levels can exacerbate the risks for coastal communities. The authors, Peter Matanle, Joel Littler and Oliver Slay, argue that for rural coastal communities in particular, Japan has not adopted the appropriate DRM policies in an era characterized by climate crisis. This situation is in spite of the fact that the Government of Japan has recognized the relationship between climate change and rising sea levels. Moreover, Japan is also a member of the United Nations Framework Convention on Climate Change (UNFCCC) and a signatory to the 2015 Paris Agreement, which was ratified in the country on November 8, 2016, legally binding Japan to climate mitigation and adaptation.

The potential consequences of excluding climate change in DRM practices may be symptomatic of a desire to believe that disaster management is simply a problem to be solved by modern engineering. In this view, concrete infrastructure can easily fix the “defects” in nature, a view also shared in North America and Singapore. The Government of Japan’s revisions to the state’s flood and river control laws in 2017, aiming to decrease the number of casualties lost to water-related natural disasters by evacuation failures to zero, may have been bolstered by faith in human-designed engineering feats. However, natural disasters, which are becoming more severe due to the climate crisis, cannot simply be solved with an engineering mindset, but rather must be approached with a diverse range of DRM practices.

HOW CAN JAPAN IMPROVE DRM PRACTICES ?

An academic study on the influence of climate change for DRM practices in a rural Japanese town found that there is a need for a more holistic and inclusive approach to risk-reduction planning, involving multiple stakeholders such as national and local governments along with community members. Smaller, rural cities have limited resources to effectively combat the risks posed by climate change on the severity of natural disasters. With young people migrating to larger cities, many smaller towns have a large elderly population who will be disproportionately affected. Capacity-building between high in-

come cities and less wealthy, smaller cities is important for creating disaster response plans that can adequately manage the risks posed by climate change. This capacity-building is even more important when considering that a significant amount of power is delegated to local governments in Japan. Previous natural disasters have indicated that the national government failed in applying DRM practices when they were completely delegated to local governments.

As enhanced capacity-building between low- and high-income cities becomes more important, so does the need for the national government to consider specific local circumstances when designing DRM practices. In order for DRM practices to gain acceptance in local communities, the perspectives of community members need to be represented in the policymaking process. In particular, older community members who have lived in a city for many years can play an instrumental role in effectively implementing DRM practices, as they may have firsthand experience in observing the effects of climate change on the severity of natural disasters.

Accordingly, these groups could provide suggestions as to how to improve the effectiveness of local DRM practices and serve as a trusted source to convince other community members why there is a need to adopt new or enhanced practices. Community leaders could also bridge the integration between local level DRM approaches with national ones and inform long-term strategies by collaborating more strongly with the scientific community as well as municipal and prefectural governments. In turn, these strategies can improve Japan’s DRM practices in the advent of a climate disaster.



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Fueling Terror: Water scarcity and its impact on conflict and extremism in MENA

BY FARLEY SWEATMAN | MIDDLE EAST & NORTH AFRICAN AFFAIRS



THE Middle East-North Africa (MENA) region has a water problem. Despite housing six per cent of the world's population, the MENA region controls only one per cent of the world's freshwater resources—a disparity that is likely to worsen as climate change accelerates. Rising temperatures across MENA have resulted in protracted heat waves and near-continuous droughts. These adverse environmental conditions have disrupted traditional agrarian practices, pushing millions into crowded urban centers. The migration of people from rural to urban areas, compounded by diminishing economic opportunities and widespread authoritarian rule, has fueled large-scale civil unrest. With their livelihoods in jeopardy, impoverished farmers have become vulnerable targets for terrorist recruiters. Extremist organizations continue to exploit water and food shortages, capitalizing on the subsequent turmoil to expand their support base.

A BLEAK FUTURE

MENA is the world's most arid region and will continue to feel the impact of water scarcity for the foreseeable future. Of the 37 countries characterized by “extremely high” water distress levels, 15 are in the Middle East. With summer temperatures expected to increase by more than twice the global average, MENA's limited water resources will be put to the ultimate test. Water stress in MENA has been steadily worsening over the last five decades—its per capita renewable water resources today are

a quarter of what they were in 1950. Current predictions indicate that water resources in the region will continue to fall to 11 times below the global average by 2050.

Diminishing water resources and high temperatures have accelerated the rate of desertification and have led to a significant loss of arable land. In Syria, water scarcity and the gross mismanagement of existing resources have forced some 1.5 million farmers to abandon their land and move to the cities. Chronic drought has also left MENA dependent on food imports. Iraq, once a self-sufficient food producer, now imports 70 per cent of its food supply. Furthermore, Saudi Arabia has become entirely reliant on grain imports in an effort to stave off water resource depletion.

RISING TENSIONS

According to NASA, the MENA region has been plagued by constant drought since 1998. It is important to note that these droughts are not solely climate-related. The Tigris and Euphrates Rivers which dominate Iraq's Fertile Crescent are drying up. Since the mid-1970s, dams built upriver in neighbouring Syria, Turkey, and Iran have reduced the amount of water that Iraq receives by about half. Turkish dams on the Euphrates have cut the flow of water to Syria and Iraq by 40 and 80 per cent respectively. Facing accelerated desertification rates, Iraq stands to lose up to half—124 million acres—of its limited arable land.

Reduced freshwater resources have also allowed for salt-water to creep up the Shatt al-Arab waterway (known as 'Arvand Rud' in Persian), where the Tigris and Euphrates Rivers converge near the Persian Gulf, resulting in the destruction of rich agricultural land in southern Iraq. The depletion of Iraq's water supply, along with elevating tensions with its neighbours, impedes Iraq's economic recovery following decades of conflict.

Another man-made drought threatens to destabilize the Nile Basin. The Nile River – essential to Egypt's agricultural needs – has lost much of its flow over the past few

PHOTO SOURCE: FLICKR, ALI AL-TAWHAMI

decades due to a combination of natural droughts and the construction of dams upriver. Ethiopia is currently in the process of constructing its Grand Renaissance Dam, which will be the largest hydroelectric dam in Africa. When completed, the dam will reduce the Nile's flow by 25 per cent, interrupting water supplies to millions of Egyptians. Egypt has threatened military action following Egyptian President Abdel Fattah al-Sisi's declaration that the dam is a "matter of life and death" for his country.

THE BOILING POINT

Desperation breeds conflict. Water scarcity and rising temperatures in MENA will likely increase the potential for violent competition over dwindling resources in the coming years. Water scarcity was essential to the outbreak of Syria's civil war. Between 2007 and 2015, severe drought and water shortages led to the death of 85 per cent of livestock and widespread crop failure in eastern Syria, prompting large-scale migration into overpopulated cities. By 2010, over 20 per cent of Syria's urban population was composed of internally displaced persons. This mass displacement and subsequent unemployment were crucial components in triggering the unrest that escalated into civil war in 2011.

The U.S. military regards climate change as a "threat multiplier" within MENA. When people cannot meet their basic needs and there is fierce competition over what few resources remain, many will turn to those who offer quick solutions to their problems. Exploiting this sense of desperation, terror organizations have adopted the strategy of controlling water resources as a means of exerting influence over populations. A report by the German foreign office linked the effects of climate-induced drought to the growing power of the Islamic State in Iraq and Syria (ISIS), stating that ISIS "tried to gain and retain legitimacy by providing water and other services to garner support from local populations." ISIS recruiters have lured rural Syrians and Iraqis into their ranks with offers of money and food. Faced with the loss of their homes and livelihoods, many have accepted these economic incentives and joined the jihadist group.

The tactic of weaponizing water as a means of exerting control is not limited to ISIS. Al-Qaeda in the Arabian Peninsula (AQAP) in Yemen, Al-Shabaab in Somalia, and

ISIS's Libyan branch have all exploited water scarcity in their respective countries' ongoing civil wars. In a country critically short of water, AQAP has built wells in areas it controls to win support from the local populations. By contrast, Al-Shabaab has adopted a slightly different tactic in Somalia. According to a member of the Somali parliament in 2014, Al-Shabaab had "started to cut off liberated cities from the water source so that they can demonstrate some kind of power and presence." Similarly, ISIS has recognized the influence of water in Libya. Since losing their stronghold of Sirte, ISIS has launched attacks on the nearby Great Man-Made River Project – a station crucial for supplying cities on the Libyan coast with water pumped from the desert region to the south.

FINDING A SOLUTION

Governments within MENA and their international partners must address climate change and water scarcity before they can hope to effectively curtail extremism. Water stress conditions, as both a security and humanitarian concern, must be integrated into counterterrorism efforts. These at-risk states should focus on providing basic food and water resources to neglected rural communities in order to sustain the local economy. If water and food security is improved, it will be harder for extremist groups to garner support among local communities.

With temperatures expected to rise in the near-future, MENA countries must find ways of adapting to deal with the harsh realities of climate change. Climate resilience could be achieved through the diversification of crops. There must be a shift away from water-intensive irrigated crops to rain-fed agriculture like lentils and chickpeas. Significant investment in renewable energy is required for long-term stability in the region. Solar power in particular could provide rural communities with affordable energy that is more feasible in terms of water usage than hydroelectric dams. If crop diversification and renewable energy is not possible, states must develop contingency plans to provide other means of employment to rural communities threatened by climate change.



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Northern Triangle Safe Third-Country Agreements: Effective or dangerous?

BY AMAL ATTAR-GUZMAN | SOUTH & CENTRAL AMERICAN AFFAIRS

CENTRAL AMERICAN DRY CORRIDOR



IN late September, then-acting United States Secretary of Homeland Security Kevin McAleenan signed a “memorandum of understanding” with Salvadoran Foreign Minister Alexandra Hill on the Central American migration crisis. Weeks earlier, McAleenan met with Salvadoran President Nayib Bukele to discuss the “shared responsibility” to improve economic growth in the region and encourage migrants to remain in their country of origin. McAleenan explained,

Today we’re very happy to announce the signing of this cooperative agreement between the United States and El Salvador to build protection capacity...to further our efforts for opportunities to seek protection for political, racial, religious or social group persecution as close as possible to the origin of individuals who need it.

Shortly after, the U.S. established a series of bilateral safe third-country agreements with El Salvador, Honduras, and Guatemala in early October to restrict the amount of Central American migrants reaching the southern U.S. border. A safe-third country agreement is a treaty

between nations that controls the flow of refugees and asylum-seekers by mandating those who seek refugee status to make their asylum claim in the first country they arrive in, with few exceptions.

According to the agreements, the three Northern Triangle countries would take in any asylum-seekers bound for the U.S., so long as the principle of *non-refoulement* is upheld. For instance, El Salvador cannot accept the return of Salvadorans who fled to the U.S. and are now being deported, since it would violate the principle of *non-refoulement*, a principle of international law which states that nations may not forcibly return refugees or asylum-seekers to countries where they may be subject to persecution. In keeping with this principle, refugees and asylum seekers can only be deported to countries where their lives will not be threatened and where they will have full access to fair asylum proceedings and protocol.

While safe third-country agreements may control the number of Central American migrants arriving and remaining in the U.S., deporting migrants back to Northern Triangle countries risks worsening the economic, social, and environmental conditions responsible for mass emigration from the region.

A MOUNTING CRISIS

Estimates from the last few years suggest that 265,000 people leave the Northern Triangle region annually to migrate north, most of whom are bound for the U.S. This statistic is expected to increase by over 100 per cent in 2019, as a surge of Central Americans from the Northern Triangle have fled their countries due to increasing corruption, poverty, social insecurity, gang violence, and a lack of economic opportunity.

According to 2017 data from the Council on Foreign Relations, homicide rates in the Northern Triangle are at an all-time high. In El Salvador, there are 51 homicides

for every 100,000 people, followed by Honduras, 40 homicides per 100,000 people, and Guatemala, 22 homicides per 100,000 people. Under these safe third-country agreements, Salvadoran migrants escaping rampant gang violence would be forced to remain in Honduras, where the rates of violent crime are still shockingly high.

Moreover, Northern Triangle countries do not have the infrastructure or economic resources needed to provide for the increasing number of migrants crossing their borders. According to the U.S. Agency for International Development (USAID), about half of Central Americans in Honduras, Guatemala, and El Salvador live below the national poverty line.

IMPACTS OF CLIMATE CHANGE

Climate change is another major cause of emigration from the Northern Triangle. Guatemala, Honduras, and El Salvador have been the most impacted by the Central American dry corridor, an ecological region on the Central American Pacific coast. The region is suffering increasingly from extreme flooding and droughts, negatively impacting the agricultural sector, which accounts for more than 30 per cent of jobs in the Northern Triangle. Consequently, the majority of Central American migrants come from the dry corridor. The effects of climate change on economic conditions have been compounded by rising food insecurity. Due to the high rates of poverty and child malnutrition in the agrarian western highlands of Guatemala, a disproportionate number of Guatemalan migrants emigrate from this specific region.

Recent cuts to American foreign assistance in the Northern Triangle have only exacerbated the poor social, economic, and environmental conditions in the region. Since 2014, U.S. foreign assistance to the Northern Triangle has totaled just \$2.5 billion USD, accounting for only 0.47 per cent of total U.S. government spending on foreign assistance during that time period. Moreover, this total includes over \$1.2 billion USD for security initiatives, which have minimal impact on development.

While safe third-country agreements will control the influx of migrants to the U.S. by sending them to another country in the Northern Triangle, they risk exacerbating the social, economic, and environmental conditions that

prompt migration in the first place. President Trump's administration has countered such criticism by stating that these legal mechanisms can prevent migrants from falling prey to human traffickers. Conversely, human rights groups argue that these agreements can further exacerbate the problem by forcing migrants to endure similar or worse conditions than their country of origin at the hands of human traffickers. Rather than reducing human trafficking, human rights activists claim and that these agreements will only encourage refugees and asylum seekers to find new routes to arrive in the U.S.

As former Assistant Secretary of State for the Bureau of Population, Refugees and Migration, Arthur E. Dewey explains: "No level of deterrence stops the overwhelming compulsion to flee the corrupt, gang-driven hell of the Northern Triangle. Without engaging root causes, we just keep nursing the problem."

A TROUBLING FORECAST

Despite heavy criticism, deportation proceedings in the U.S. have already begun. The Trump administration and Department of Homeland Security officials are planning to deport Honduran and Salvadoran migrants to Guatemala once the deal is finalized. Similar proceedings are expected to start once safe third-country agreements are also finalized with Honduras and El Salvador.

If the safe third-country agreements are upheld, they will exacerbate the current economic, social, and environmental issues in the Northern Triangle and the number of migrants from this region will continue to rise. As a result, the Trump administration can expect to experience many more complications from this worsening crisis in the near future.



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On the Frontlines of Climate Change: Canada's Arctic in a warming world

BY MADELEINE FOLEY | NORTH AMERICAN AFFAIRS



A recent Intergovernmental Panel on Climate Change (IPCC) report estimated that the Arctic is warming at a rate that is about two times faster than the global average. As a result, the average temperature in Canada's Arctic regions has increased by 2.3 degrees Celsius since 1946. This increase in temperature is causing significant environmental changes in the region, the most dramatic of which is melting Arctic sea ice.

The Arctic's icy surface explains why it is warming at a faster rate than other regions: ice and snow reflect 80 per cent of the sun's radiation, while water reflects only 20 per cent. The IPCC estimates that if global temperatures rise by more than two degrees Celsius, the Arctic Sea will frequently become ice-free during summer months. Warmer temperatures are also contributing to the thawing of the Arctic's permafrost layers, causing increasingly intense weather episodes in the region.

The Arctic is a unique region in Canada. Canada's northernmost territories account for 40 per cent of the country's landmass and two-thirds of its coastline. They are also home to 100,000 residents, 80 per cent of whom are Indigenous peoples of Canada. Furthermore, the region contains significant oil, gas, and mining reserves, as well as strategically located military bases and shipping routes.

As a result, a changing climate has significant economic and strategic consequences for Canada. The environmental impact of climate change in Canada's Arctic will have meaningful implications at both local and national levels. Therefore, it is imperative that Canada recognize and address these emerging challenges and opportunities.

INDIGENOUS COMMUNITIES AND ADAPTATION

The Arctic's changing environment is already affecting the daily lives of communities in the region. The Arctic's population is largely Indigenous Inuit peoples, who, by some estimates, have worked and lived in Canada's northernmost regions for more than a millennium. Their lives, and livelihoods, are deeply intertwined with their frozen environment. Melting ice, thawing permafrost, and changing weather patterns not only threaten their food security and local infrastructure, but also their social traditions and cultural heritage. As a result, health professionals have raised concerns that climate change will impact both physical and mental health in these areas, leading to increased incidence of depression, anxiety, and grief in Arctic communities.

Transportation in the region is also becoming more difficult. Previously, members of Arctic communities easily moved across sea ice on various modes of land transport. However, as sea ice continues to melt, these routes have become increasingly precarious and dangerous, limiting not only the mobility of these communities, but also their accessibility. Arctic Indigenous peoples are experiencing the most immediate and intense effects of climate change in Canada. The need for these communities to adapt to dramatic environmental change is a cause for national alarm and immediate action.

PHOTO SOURCE: FLICKR, AH COLLESTON

BALANCING ECONOMIC CHALLENGES AND OPPORTUNITIES

Climate change is also creating significant economic challenges in the region. Locally, Arctic communities face an increasingly precarious economic situation, as many residents rely on the environment for their livelihood. At the same time, the Arctic now experiences longer periods without continuous ice coverage, leading to the emergence of new economic activities in the region. Industries like mining, oil, gas, and fishing are beginning to actively operate in the area. Some estimates suggest that the Arctic may contain one-quarter of the Earth's remaining oil and gas reserves, and significant volumes of unearched minerals. In addition, melting ice has opened up the possibility of new shipping routes between Asia and Europe, and will likely lead to related infrastructure developments in the area to support increasing maritime traffic.

The Canadian federal government has identified these developments as an opportunity to bring employment, infrastructure investment, and access to Arctic communities. At the same time, other nations have also recognized the Arctic as a source of economic opportunity and are becoming increasingly active in the region. China, for example, recently unveiled its plans to create a 'Polar Silk Road' across the Arctic through increased investment in infrastructure and shipping routes. International economic competition in the region is likely to bring additional challenges for climate adaptation and environmental protection.

Unsurprisingly, these economic opportunities also pose significant risks to the Arctic environment and ecosystems. Resource extraction in the Arctic will contribute to increasing global greenhouse gas emissions and the growth of these industries in the region may further threaten the livelihoods of Indigenous communities. The risks must be managed effectively to ensure that Arctic economic growth is both equitable and environmentally sustainable.

NEW GEOPOLITICAL THREATS

Climate change may also intensify geopolitical dynamics in the Arctic. Eight countries – Canada, Denmark,

Russia, the U.S., Norway, Finland, Sweden, and Iceland – comprise the Arctic region and also form the Arctic Council, an international forum that addresses Arctic-specific issues. As Arctic ice continues to melt, the resource-rich region has become strategically important to these countries. In early 2019, President Vladimir Putin announced efforts to expand Russia's presence in the Arctic. The country currently maintains a military base as well as several airfields, ship ports, and other defense facilities in its Arctic territories. Although this expansion is largely driven by perceived economic opportunities, Russia's increased military presence in the region has nevertheless raised strategic concerns for all Arctic nations.

As the Arctic becomes more accessible, international disputes around national sovereignty and control have become more prominent, as there are several disputed maritime borders in the region. Most recently, Canada, Denmark, and Russia have each claimed sovereignty over the Lomonosov Ridge, a 1,400-kilometer ridge in the Arctic ocean. Canada has also long laid claim to the Northwest Passage, a body of water that runs along Canada's Arctic border. At a recent meeting of the Arctic Council, the Trump administration declared Canada's claims to be "illegitimate," spurring increased debate about Arctic sovereignty and maritime boundaries.

WHAT'S NEXT ?

The Canadian Arctic faces a myriad of challenges with respect to climate change. As one of the most affected areas in the world, the Arctic is an illustrative example of the social, economic, and geopolitical impacts of climate change. These effects should also serve as an impetus for Canada to develop strategies to manage changing global landscapes. Given their unique economic and cultural ties to the Arctic region, Indigenous peoples of Canada must be active participants in further discussions on how to mitigate and adapt to the effects of Arctic warming. In a warming world, Canada, and other nations, must work cooperatively to mitigate damages and maximize opportunities.



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