The 43rd Annual

UNIS-UN INTERNATIONAL STUDENT CONFERENCE WORKING PAPER

RIPPLE EFFECT: THE WATER CRISIS

A Letter from the Co-Chairs

Dear Participant,

We'd like to take this moment to thank you for coming to this year's conference, and to introduce ourselves and the rest of the UNIS-UN organizing and executive committees. Ms. Sylvia Gordon founded UNIS-UN in 1976 at the United Nations International School. She wanted to create an event in which her students and visiting students could meet to discuss pertinent world issues. Over the years UNIS-UN has evolved into the largest student-run conference held in the United Nations General assembly, with over 500 students attending from five continents.

Every year we begin planning in April by interviewing and selecting the Executive Committee. This is the core planning body for the conference. We are then divided into six commissions: Editing, Finance, Logistics, Visiting Schools, Speakers, and Technology. Together we work with UNIS students making up the Organizing Committee to plan all aspects of the conference, from website design and social media presence to speaker and participant invitations and more.

The conference days have been planned to cover a wide spectrum of themes related to the water crisis. As you hear from speakers and debate panelists we hope that you will not only express your own voice but also carry what you learn and experience here through to your own countries and communities. We've worked hard to plan a marvelous experience for you, and we are excited to welcome you to our city and to the 43rd annual UNIS-UN Conference.

Here's to a wonderful conference!

Sincerely,

Noëlla Kalasa and Sophia Duff

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THE VIEWS EXPRESSED IN THIS WORKING PAPER AND AT THE UNIS-UN CONFERENCE ARE NOT NECESSARILY THOSE OF UNIS, THE UNITED NATIONS, OR THEIR AFFILIATES

Foreword

The water crisis is raising questions on human survival. What do you ask when faced with the issue of flooding on one hand, drought on the other, both clouded by conflict and uncertainty? Flooding pollutes water sources, drought takes them away. Both are also endangering food resources, by damaging agricultural gains. Climate change is driving the water crisis, and the water crisis is driving conflict. Without effective management of our water resources, we risk intensifying disputes between communities and increasing tensions among nations. The availability of safe water and adequate sanitation is changing worldwide. 844 million individuals live without access to safe water. 2.3 billion people live in areas in need of improved sanitation. Every two minutes, a child is killed by a water or sanitation related disease. On July 28, 2018, Resolution 64/292 passed in the United Nations General Assembly, recognizing the human right to water and sanitation. Yet, as environmental refugees seek asylum in water secure countries, they are refused at the door.

The goal of this working paper is to address some of the big questions related to the water crisis. We hope that by reading these articles, you will be able to think objectively about the crisis, and form ideas on sustainable solutions to these issues. As you hear from speakers and debaters, this information is at your disposal for contribution to the discussion. This issue is one with a ripple effect: as the water crisis worsens, many issues–gender inequality, food insecurity, poverty, power imbalances, child mortality–are heightened.

Debate Motion I:

'Industrialized countries have a greater responsibility for sustainable development.'

This motion is based on the notion that industrialized countries share a greater responsibility in the water crisis as they have a heavier impact on the environment. In debating this, we would like you to look into the climate justice and climate equity, as well as geoengineering and sustainable development strategies. Consider the ethical aspect of the issue, heavily based on history and consequent economic inequality. Ask yourselves: What is the role of water in economic development? Which resources are needed for waste treatment? How do drought and flooding affect agriculture, and where is agriculture a primary source of income? What are the root causes of increasing flooding and drought?

Debate Motion II:

'Climate migration will be the biggest threat to worldwide political stability.'

In debating this, we would like for you to consider the impact of climate change on regions at risk for complete flooding, like small pacific islands and regions at sea level, as well as regions near the equator, which are at risk for extreme drought. Where will those currently inhabiting those regions go? What plans and accords have already been put in place between potential hosts and these countries? Which countries have not made such accords, and why might this be? What will be the consequences of mass migration from regions at risk from flooding and drought in host countries? Is there a way of mitigating, delaying, or preventing these environmental risks? These are some of the questions we hope debaters will address when arguing for or against this motion.

Blue Gold: How valuable is water as a commodity?

By: Noella Kalasa

Goldman Sachs has called water the petroleum of the next century. Crude oil costs \$1.21 per gallon.¹ The same amount of bottled water costs \$1.22.² Like the fossil fuel, supplies of water all over the world are under threat. However, unlike petroleum, once water runs out, we will not be able to find an alternative. We need water to survive, and as populations increase, so do needs for drinking and sewage water. Cities, or urban centers, are forecasted to hold 6.3 billion people by 2050, nearly twice the 3.4 billion dwellers counted in 2009.³ The World Wildlife Fund estimates that by 2025, two-thirds of the global population will live in areas facing water shortage.⁴

Sustainable Development Goal number six aims to "ensure availability and sustainable management of water and sanitation for all." It will take an investment of approximately \$449 billion per year in infrastructure to reach the SDG targets by 2030.⁵ Climate change is a catalyst to this issue, as damage from flooding (which costs \$120 billion per year) and drought will only increase.⁶ This is because for water to be directly transported and stored, tankers and pipelines need to be acquired, installed, and maintained.⁷ Whose responsibility is this? The SDGs make no specification as to whether states are responsible for their countries' water. Water has become an extremely valuable commodity, and increasing areas of the world are facing economic water scarcity, with available water becoming increasingly unaffordable.⁸ The percentage increase of water prices per year in the United States has not fallen below 4% since 2010.⁹ In the United Kingdom, Jeremy Corbyn, leader of the Labour Party, has promised to nationalise water companies in order to make water more affordable.¹⁰

As estimated by the World Bank, by 2030, the world will experience a 40% deficit between supply and demand of water. This diminishing store of water is primarily supplied by aquifers systems and transboundary basins. In 2017, only 59% of national transboundary basins were covered by an operational arrangement. Based on data from the United Nations, 62 out of 153 countries share transboundary waters, sparking conflicts between nations and creating social unrest.¹¹ Water management policies, poverty, and power relationships have been identified as root causes of the water crisis by the United Nations Development

¹ OIL (WTI), Commodity. Business Insider Markets. January 1 2019.

² Boesler, Matthew. "Bottled Water Costs 2000 Times As Much as Tap Water." Business Insider, 12 July 2013.

³ United Nations World Water Assessment Programme Background Information Brief. UNESCO.

⁴ "Water Scarcity Overview." World Wildlife Fund.

⁵ Flood, Chris. "The New Oil: How Investors Can Keep Water Flowing." Financial Times, 12 May 2018.

⁶ "Water Resources Management." World Bank, 20 Sept. 2017.

⁷ R-A Young, J-B Loomis. *Determining the Economic Value of Water: Concepts and Methods.* New York: Routledge 2017. p 358.

⁸ "The Challenge of Resource Management - Water ." BBC News, BBC, 2018.

⁹ Water Rates Dashboard. Brett Walton. Circle of Blue, 2018.

¹⁰ Flood, Chris. *"The New Oil: How Investors Can Keep Water Flowing."* Financial Times, Financial Times, 12 May 2018.

¹¹ United Nations Economic and Social Council. *Progress towards the Sustainable Development Goals - Report of the Secretary General.* 10 May 2018.

Programme.¹² These issues, deeply tied to countries' economic, geopolitical, and social development, can be potentially resolved if GDPs are increased. Yet, economic strength is extremely dependent on water.

For agriculture, chemicals, mining, energy, tourism, and sanitation, water is blue gold. Water is required for an industry to grow. Growing urban centers with rising populations require water for drinking, cooking, and cleaning, as well as for city sanitation.¹³ Furthermore, industrial centers use water as a raw material, a coolant, and as a mode of transport. This means that lack of water equates to inability to industrialize, and so, corporations have begun competing for this increasingly scarce resource.

The heart of the blue gold business lies within the virtual water trade. There is no global market or price for water. Water-rich regions, like the Americas, Australia, and Eastern Europe, trade water-intensive commodities with water-dependent regions, like occidental Europe,¹⁴ who, between 2014 and 2015, experienced a 10% increase in water scarcity.¹⁵ Within countries themselves, water is also exchanged from agricultural sectors to the urban and industrial sectors. Agriculture accounts for 70% of global water withdrawals, and the economic benefit from irrigated land is more than double that of rain-dependent crops.¹⁶ Commercial agriculture in developing countries is not only exacerbating the water crisis due to the volume consumed, but also due to the consequent pollution from farm runoff. At the same time, it is very difficult for countries to move towards sustainable water production without readily available water.

It is well known that petroleum fuels many wars, because of its value as a commodity and its worth as an environmental resource. A study initiated by the Pacific Institute in the 1980s has, over the years, identified hundreds of areas in the world where *water* is a trigger, weapon, and/or casualty of local and international disputes.¹⁷ Sources of water have become sources of war. Blue gold, like its counterpart crude oil, is tainted with the red stain of conflict, and its price is only increasing.

¹² The United Nations Development Programme. *Beyond scarcity: Power, poverty and the global water crisis.* Human Development Report. New York: UNDP. 2006.

¹³ *Ibid*.

¹⁴ *Ibid*.

¹⁵ Use of freshwater resources. European Environment Agency. 21 Mar 2018.

¹⁶ *"Water in Agriculture."* World Bank, 12 July 2017.

¹⁷ Gleick, Peter. *"Water Conflict."* The World's Water. Volume 9. Pacific Institute, 2018.



Water Scarcity

By: Anna Bianco

71% of the Earth's surface is water-covered. The annual rainfall is around 100cm.¹⁸ Yet the discussion continues about the lack of water availability. Water scarcity is when there is an insufficient amount of water to meet demands where freshwater is needed. Limited access to safe water can be a result of physical water scarcity, where there is an inadequate supply of natural water being derived from the earth. Another type of scarcity is economic water scarcity. Agricultural activities like crop and food production can affect the quantity of accessible water due to agriculture's high consumption and mismanagement of water.

Dry areas of the world such as deserts or arid regions are most often associated with physical water stress, which is when a nation's water resources are insufficient for its needs. Recently, however, there has been a rising amount of regions where physical water scarcity is caused by human activities. An excellent example of an abundant water source being over managed is the Colorado river basin in the United States. Not only does 70% or more of the river's water go towards the irrigation of 3.5 million acres of cropland, but also the river serves 30 million people in seven U.S. states and Mexico.¹⁹ This is concurrently leading to serious water scarcity.

500 million people are inhabitants to developing countries such as Yemen, Libya, and Jordan where water scarcity is quickly worsening.²⁰ Yemen, one of the many countries that is experiencing a water crisis, is facing estimates suggesting the capital, Sanaa, could run out of water in 10 years.²¹ Almost 1.2 billion people live in areas with physical water stress, where the water is limited due to ecological constraints. All of these regions are experiencing environmental demolition, pollution, and a lessening amount of groundwater supplies. Overall, the shortage of water caused by physical, economic or institutional constraints is already a problem for one-third of the world's population.

Water scarcity is not an issue with the quantity of water resources on earth, per se, but rather the uneven distribution of water that we have available to us. Agriculture, the world's largest water user, which is responsible for about 70% of worldwide water withdrawals, is constantly competing with domestic, industrial and environmental uses for a water supply.²² Globally, water stress has increased to 1.7 times faster than population over the last 100 years. 27 countries dedicate more than 90% of their water withdrawal to agriculture, and 8 countries even more than 95%. FAO Water mentions, "farming accounts for almost 70 percent of all water withdrawals, and up to 95 percent in some developing countries." An example is a case study

 ¹⁹ Zielinski, Sarah. "The Colorado River Runs Dry." Smithsonian.com, Smithsonian Institution, 1 Oct. 2010, www.smithsonianmag.com/science-nature/the-colorado-river-runs-dry-61427169/.

¹⁸ "How Much Rain Falls on the Earth Each Year?" *Earth Science Stack Exchange*, Jan. 2018, earthscience.stackexchange.com/questions/13200/how-much-rain-falls-on-the-earth-each-year.

²⁰ Molden, David, et al. "Water Scarcity: The Food Factor." Issues in Science and Technology, 15 May 2015, issues.org/molden/.

²¹ Ruhayem, Rami. "Yemen Facing Water Shortage Crisis." BBC News, BBC, 21 Aug. 2013, www.bbc.com/news/av/world-middle-east-23777176/yemen-facing-water-shortage-crisis.

²² International Water Management Institute

based in California in the "unwise use of natural resources."²³ Farmers are drilling and pumping billions of gallons of water from the grounds and wells at a rapid pace-depleting groundwater, a resource that was already extremely limited even before the drought. As the drilling continues across California, the consequences of the overuse of groundwater are coming to light. Water tables have dropped 50 feet or more in just a pile of years.²⁴ The surface of the land is sinking as much as one foot throughout a year, due to less underground water to able to sustain it. This is causing roads to cave in and bridges to break in two. Wells that aren't too deep are beginning to dry up as well.

In addition to being a major cause, agriculture can inversely be a casualty of water scarcity. Cultivation of the soil for growing crops is a large chunk of agriculture that is compromised when faced with the lack of water available. Without water, farmers are not able to properly tend to their crops and hence, unable to provide nutrition for our rapidly growing population. According to a new UN DESA report, global population is expected to hit 9.7 billion by 2050.²⁵ Depending on diet, humans require "2000 to 5000 liters of water to produce the food consumed daily by one person."²⁶ Seeing that the population globally is predicted to reach 10 billion people by 2050, demand for nutrition is anticipated to increase by more than 50%. With the continuous growth of revenue earnings and international diet changes, it is likely that food demand could double by the year 2050.²⁷ As a consequence, by 2025, if current consumption patterns continue, research infers that two-thirds of the global population could potentially be living in water-stressed areas and water-stressed industries.

Additionally, agriculture's water consumption is by far the largest globally and a major cause of water pollution. Unsustainable agricultural water habits, which are stated above, are in effect already to the sustainability of communities dependent on both water and agriculture. Among some examples of unsustainable water habits, is irrigation and the depletion of underground aquifers. If soil is ever over irrigated, due to poor distribution uniformity, it could head to water pollution. If there is no upturn in water productivity, agricultural water consumption would also consequently double.

With all of the profitable demands of this natural resource, such as industrial agriculture, hygiene, and so on, it is difficult for many to envision a future where 9 billion people (by 2050) will have these simple needs met easily.

²³ Gillis, Justing, and Matt Richtel. "Beneath California Crops, Groundwater Crisis Grows." The New York Times, 5 Apr. 2015, www.nytimes.com/2015/04/06/science/beneath-california-crops-groundwater-crisis-grows.html.

²⁴ Gillis, Justing, and Matt Richtel. "Beneath California Crops, Groundwater Crisis Grows." The New York Times, 5 Apr. 2015, www.nytimes.com/2015/04/06/science/beneath-california-crops-groundwater-crisis-grows.html.

²⁵ "World Population Projected to Reach 9.7 Billion by 2050 | UN DESA Department of Economic and Social Affairs." United Nations, United Nations Department of Economic and Social Affairs, 29 July 2015, www.un.org/en/development/desa/news/population/2015-report.html.

²⁶ "Water Scarcity – One of the Greatest Challenges of Our Time." International Rice Commission Newsletter Vol. 48, FAO of the UN, 12 Apr. 2017, www.fao.org/zhc/detail-events/en/c/880881/.

²⁷ Molden, David, et al. "Water Scarcity: The Food Factor." Issues in Science and Technology, 15 May 2015, issues.org/molden/.



Drinking Water: How does access to drinking water affect daily lives in different regions and for different gender roles?

By: Max Michael

According to the United Nations, water is both a necessity for life and a human right, which is why the average person is recommended to drink two liters of water per day. However, 2.1 billion people worldwide lack access to readily available and safe drinking water at home, while 4.5 billion people don't have safely managed sanitation.²⁸ Inadequate sanitation and poor water quality have negatively affected lifestyle choices and educational opportunities worldwide. Specifically, the girls and women in countries like Libya and Yemen, where they do not have easy access to water, are forced to walk miles every day to provide safe drinking water for their families. This human right, or the lack thereof, impacts the safety and education of girls all over the world.

Trying to access safe, drinkable water often takes up much more time and effort for women and girls in rural, low-income countries in Asia and Africa compared to the men and boys of the community. In 2005, only 16% of people in sub-Saharan Africa had access to drinking water through a household connection.²⁹ Not only is there poor access to readily accessible drinking water, even when a water source is available, there are also risks of contamination. This causes families to resort to sending someone on a walk for water. On average, the distance that women in Asia and Africa have to walk per day is 3.7 miles, adding up to 15 hours per week.³⁰ Because it is not a family effort to collect water, the responsibility is heavily placed on the girls and women of the communities. Women over 15 are the main collectors of water. In fact, they are more than four times more likely to be collecting water than men over 15. In Benin, young girls spend an hour per day collecting water, while young boys only spend around 25 minutes.³¹ Due to this, water accessibility is a gender equality issue, especially in developing countries. For instance, girls and women in sub-Saharan Africa, such as Mauritania, Somalia, Tunisia, and Yemen, spend an average of 200 million hours per day collecting heavy loads of water.³²

Lack of easily accessible water and sanitation doesn't just take up time and effort for girls and women, it also lowers their education rate and puts them at higher risk for violence. In Tanzania, school attendance for girls would be 12% higher if they lived 15 minutes or less from

²⁸ "2.1 Billion People Lack Safe Drinking Water at Home, More than Twice as Many Lack Safe Sanitation." World Health Organization, World Health Organization, 12 July 2017, www.who.int/news-room/detail/12-07-2017-2-1-billion-people-lack-safe-drinking-water-at-home-more-than-twic e-as-many-lack-safe-sanitation.

²⁹ Lewis, Lori. "Water In Crisis - Spotlight Africa: Rural and Urban Issues." *The Water Project*, thewaterproject.org/water-crisis/water-in-crisis-rural-urban-africa.

³⁰ "How Water Impacts the Lives of Girls." *Girls Education - Plan International Canada*, plancanada.ca/infographic-how-water-impacts-the-lives-of-girls.

³¹ "Women, Woman, Gender, Decade, Water for Life, 2015, UN-Water, United Nations, MDG, Water, Sanitation, Financing, IWRM, Human Right, Transboundary, Cities, Quality, Food Security, UNDESA." United Nations, United Nations, www.un.org/waterforlifedecade/gender.shtml. Last updated: 2014/10/23

³² Vogelstein, Rachel. "Water Access Is a Gender Equality Issue." *Council on Foreign Relations*, Council on Foreign Relations, www.cfr.org/blog/water-access-gender-equality-issue.

a water source, but for boys, attendance wouldn't be affected.³³ In developing countries, contaminated water is the biggest cause of girls missing school. As a child faces a decision between contributing to their family's well-being and receiving an education, more often than not they have no choice but to give up attending school some days. Not only do they miss out on a better quality of education, but they contract illnesses from the unsafe water, and this causes a total loss of 443 million days of school per year.³⁴ This loss in education generally leads to a decreased opportunity in earning an income later in life, a common cycle for women that results in poverty and reliance on the men in the household. Research has shown that for every 10% increase in literacy in women, life expectancy at birth increases another 10% and there is 0.3% of economic growth. Educated women are also more likely to participate in community decisions.³⁵ Overall, educating women is beneficial to everyone in the communities.

The lack of easily accessible water also lowers the rates of safe and hygienic sanitation. 946 million people practice open defecation. 9 in 10 of those people live in rural areas and the conditions where they have to go to the bathroom are often teeming with bacteria. That and bacteria-infested water are the causes of diarrheal diseases that kill nearly 1,000 children per day.³⁶ Countries such as Chad and Niger held 594 and 485 deaths per 100,000 children each year, respectively.³⁷ However, in 2015, India and Nigeria had the highest amount of child deaths, contributing 42% of all 499,000 child deaths. Annually 3.4 million people die from a disease contracted by unsafe water.³⁸ These are diseases like Trachoma, one of the leading causes of blindness. These diseases are almost unheard of in more developed countries, that have easy access to potable water and safe sanitation. Not only health risks, but girls often wait until late at night, and travel to the outskirts of the village to relieve defecate and manage menstruation.

The United Nations is working towards clean accessible water and sanitation for all. It is *Goal 6: To ensure access to water and sanitation for all* out of the 17 sustainable development goals that they wish to accomplish by 2030. For years, the UN has been holding conferences (like the United Nations Water Conference in 1977), discussing ways to achieve safe water for everyone. Since then, between 1990 and 2015, the proportion of the global population using clean and safe drinking water has increased from 76% to 90%.³⁹ To reach the goal they say that there needs to be "increased investment in management of freshwater ecosystems and

³³ "Women, Woman, Gender, Decade, Water for Life, 2015, UN-Water, United Nations, MDG, Water, Sanitation, Financing, IWRM, Human Right, Transboundary, Cities, Quality, Food Security, UNDESA." *United Nations*, United Nations, and a standard state of the standard state of the standard state of the standard state of the state of

United Nations, www.un.org/waterforlifedecade/gender.shtml. Last updated: 2014/10/23

³⁴ "ONE DROP." Every Mom Needs to See This #MoreFirsts Video,

www.onedrop.org/en/news-event/water-children-and-education/.

³⁵ Patchett, Emma. "'The Curse': the Impact of Sanitation on Schoolgirls in the Developing World." *The Guardian*, Guardian News and Media, 14 June 2010,

www.theguardian.com/journalismcompetition/sanitation-schoolgirls-in-the-developing-world.

³⁶ "Children Dying Daily Because of Unsafe Water Supplies and Poor Sanitation and Hygiene, UNICEF Says." UNICEF, 21 Mar. 2013, www.unicef.org/media/media_68359.html.

³⁷ "Despite Substantial Global Reduction in Diarrhea Deaths, Half a Million Children Still Die from Diseases Each Year." Institute for Health Metrics and Evaluation, 16 Aug. 2017, www.healthdata.org/news-release/despite-substantial-global-reduction-diarrhea-deaths-half-million-children-stil I-die.

³⁸ World Health Organization, World Health Organization, www.who.int/water_sanitation_health/takingcharge.html.

³⁹ "Water and Sanitation - United Nations Sustainable Development." United Nations, United Nations,

www.un.org/sustainabledevelopment/water-and-sanitation/.

sanitation facilities on a local level in several developing countries within sub-Saharan Africa, Central Asia, Southern Asia, Eastern Asia, and South-Eastern Asia." To make this change, multilateral organizations including nonprofits as well as private sector leaders are investing in projects to build and repair wells. This will increase water access by building them closer to communities, ultimately cutting the hours that would have been needed to walk by much shorter. A social enterprise model for a women-run center in Nigeria recently installed solar pumping technologies. It has shown to provide tremendous improvements for reducing time spent collecting water for over 6,000 women. It has also successfully provided safer, better access to clean drinking water for over 30,000 people leading to an increase in economic, health, and social outcomes. The UN is continuously fighting for access to clean drinking water for countries that are lacking it because, without it, women and girls lose the right to their own time and education, as well as the contamination risks leading to death.



Water and Global Health

By: Celine Wooning

Having access to clean water is essential to ensure global health. Every year, 2 million people die from waterborne diarrheal disease because they do not have access to clean water. 2,000 children under the age of 5 die every day due to diseases spread because of contaminated water.⁴⁰ Although the number of deaths caused by waterborne illnesses has decreased over the past two decades, from 1.2 million in 2000 to 460,000 in 2016, it still poses a major threat to hundreds of thousands of people around the world.⁴¹ According to a study by the World Health Organization, if everybody on Earth had access to clean water, nearly 10% of all global diseases could be prevented.⁴² In 2010, the United Nations recognized that having access to clean water and sanitation is a human right, and in order to increase the number of people who have access to improved water sources the UN made "Clean Water and Sanitation" its sixth Sustainable Development Goal in September of 2015. By 2030, they plan to achieve universal access to clean water and improved sanitation and hygiene. Furthermore, they plan to minimize the amount of waste products that are dumped into water sources.⁴³

Malaria and waterborne diseases, including cholera, dysentery, and typhoid, are most commonly spread in areas with poor sanitation where the water source has been contaminated by pathogenic bacteria from sewage overflow, agricultural runoff, or polluted stormwater.⁴⁴ However, as of 2010, 89% of the population get water from improved water sources, which prevent the water from becoming contaminated by bacteria and other potentially harmful substances, but there are still 780 million people who regularly use contaminated water for bathing, drinking, cooking, and cleaning.⁴⁵ 24% of people living in rural regions of Ecuador drink contaminated water because they lack access to improved water sources. As a result of this, 21% of Ecuadorian children are stunted and 18% are underweight. The relationship between unimproved water and high rates of waterborne illnesses is evident in Bangladesh where 80% of the taps tested contained E. coli bacteria and other harmful bacteria and chemicals. Because of this, 24% of all deaths in Bangladesh are due to waterborne diseases.⁴⁶

⁴⁰ "Children Dying Daily Because of Unsafe Water Supplies and Poor Sanitation and Hygiene, UNICEF Says." UNICEF, 22 Mar. 2013, www.unicef.org/media/media 68359.html?p=printme. Accessed 6 Dec. 2018.

⁴¹ "Diarrhoeal Disease." *UNICEF*, Nov. 2018, data.unicef.org/topic/child-health/diarrhoeal-disease/. Accessed 7 Jan. 2019.

⁴² "How Does Safe Water Impact Global Health?" World Health Organization, 25 June 2008, www.who.int/features/ga/70/en/. Accessed 7 Jan. 2019.

⁴³ "#Envision2030 Goal 6: Clean Water and Sanitation." United Nations, www.un.org/development/desa/disabilities/envision2030-goal6.html. Accessed 7 Jan. 2019.

⁴⁴ "Common Waterborne Disease, Bacteria, Viruses and Cysts." *Global Hydration*, globalhydration.com/waterborne-disease/common-waterborne-disease-bacteria-viruses-cysts/. Accessed 7 Jan. 2019.

⁴⁵ "Accessing Access to Water & Sanitation." *Centers for Disease Control and Prevention*, 22 June 2017, www.cdc.gov/healthywater/global/assessing.html. Accessed 7 Jan. 2019.

⁴⁶ "Millions around the World Held Back by Poor Sanitation and Lack of Access to Clean Water." *The World Bank*, 28 Aug. 2017,

www.worldbank.org/en/news/press-release/2017/08/28/millions-around-the-world-held-back-by-poor-sanitation -and-lack-of-access-to-clean-water. Accessed 7 Jan. 2019.

Sanitation levels have a great impact on the quality of the water available and the spread of waterborne diseases. The lower the sanitation level of a country, the higher the rates of waterborne illnesses. Currently, 4.5 billion people, over half the world's population lack safely managed sanitation services. This means they do not have access to an "improved toilet or latrine which is not shared, from which excreta are safely disposed of in situ or treated off-site."⁴⁷ Of the 4.5 billion that do not have access to safely managed sanitation services, 892 million people have no sanitation services at all and practice open defecation.⁴⁸ The United Nations aims to stop open defecation as it can lead to the contamination of water and promote the spread of waterborne and vector borne disease, including those spread by parasites and insects.⁴⁹ Open defecation is especially dangerous for women because it makes them vulnerable to physical attacks and rape.⁵⁰

70% of the people that do not have access to safely managed sanitation services live in rural areas, compared to the 30% of people living without them in urban areas.⁵¹ The majority of people in Central Asia, Latin America, and Africa, in particular Sub-Saharan Africa, have limited or unimproved sanitation systems. It is estimated that approximately 15% of the world's population does not have any sanitation, with most of the people without it living in Sub-Saharan Africa and Central and Southern Asia.⁵² The countries with the lowest rates of improved sanitation are Ethiopia, Chad, and Madagascar in which less than 10% of the population has access to improved sanitation systems. In Ethiopia, only 7.1% of the population has access to improved sanitation as a result of severe droughts since 2015. Because of the droughts, it is very difficult for Ethiopians to get access to clean drinking water and they have to resort to collecting contaminated water from small, stagnant ponds that they share with animals or other surface water insects, leading to higher rates of disease. In contrast, 100% of the population of countries with lower rates of improved sanitation systems.⁵³ The countries with lower rates of waterborne illnesses and deaths as a result of these diseases.

After acknowledging that access to clean water and sanitation is a human right in 2010 and dedicating its sixth Sustainable Development Goal to ensuring worldwide access to them, the United Nations has worked to decrease the disparities in access to clean water between developed and developing countries. They have done this by increasing access to toilets, sinks, and improved waste management facilities. The governments of various countries and many

⁴⁷ "Use of Basic and Safely Managed Sanitation Services." *World Health Organization*, www.who.int/gho/mdg/environmental_sustainability/sanitation/en/. Accessed 7 Jan. 2019.

⁴⁸ "Use of Basic and Safely Managed Sanitation Services." World Health Organization,

www.who.int/gho/mdg/environmental_sustainability/sanitation/en/. Accessed 7 Jan. 2019.

⁴⁹ "Eliminate Open Defecation." UNICEF India, UNICEF, unicef.in/Whatwedo/11/Eliminate-Open-Defecation. Accessed 7 Jan. 2019.

⁵⁰ Tong, Traci. "A Lack of Clean and Safe Toilets Leaves Women Vulnerable to Rape and Attacks." *PRI*, 29 Nov. 2017, www.pri.org/stories/2017-11-29/lack-clean-and-safe-toilets-leaves-women-vulnerable-rape-and-attacks. Accessed 7 Jan. 2019.

⁵¹ "Use of Basic and Safely Managed Sanitation Services." *World Health Organization*, www.who.int/gho/mdg/environmental_sustainability/sanitation/en/. Accessed 7 Jan. 2019.

⁵² "Water and Sanitation." *Environmental Performance Index*, Yale,

epi.envirocenter.yale.edu/2018-epi-report/water-and-sanitation. Accessed 7 Jan. 2019.

⁵³ "Universal Access to Sanitation - UNICEF Data." UNICEF, July 2017,

data.unicef.org/topic/water-and-sanitation/sanitation/. Accessed 7 Jan. 2019.

organizations have also prioritized improving access to clean water and are working with the UN to ensure that everybody has access to clean water and improved sanitation. The government of South Sudan has built solar powered pumps that pump 40,000 liters of clean water everyday, helping to increase accessibility to clean water in one of the regions with the lowest improved sanitation and water rate.⁵⁴ In Bangladesh, the World Bank has donated \$43 billion to help increase the number of people with access to safe water in regions where the aquifers are contaminated by arsenic.⁵⁵ Unfortunately, despite the efforts being made, advisors to the UN from the WHO and UNICEF say that it is unlikely that worldwide access to improved water and sanitation will be achieved by 2030.⁵⁶

⁵⁴ Brecher, Sydni. "Experts Warn That Universal Access to Water Is off Track." *Global Citizen*, Global Poverty Project, 26 June 2018, www.globalcitizen.org/en/content/water-sanitation-united-nations-global-goal-2030/. Accessed 7 Jan. 2019.

⁵⁵ "Bangladesh: Improving Water Supply and Sanitation." *The World Bank*, 8 Oct. 2016, www.worldbank.org/en/results/2016/10/07/bangladesh-improving-water-supply-and-sanitation. Accessed 7 Jan. 2019.

⁵⁶ Brecher, Sydni. "Experts Warn That Universal Access to Water Is off Track." *Global Citizen*, Global Poverty Project, 26 June 2018, www.globalcitizen.org/en/content/water-sanitation-united-nations-global-goal-2030/. Accessed 7 Jan. 2019.



Dying Oceans

By: Jasmijn Teunissen

Covering over 70% of Earth, one of Earth's most valuable sources are oceans. They provide a plethora of vital things including, minerals, oils, food, and much more. They are also necessary because they help regulate the climate by producing over half of the world's oxygen and absorbing 50 times more carbon dioxide than our atmosphere.⁵⁷ However, the oceans we rely on so greatly are being polluted at an alarming rate. Ocean pollution, often referred to as marine pollution, occurs when harmful substances such as oil, plastic, industrial, agricultural waste, and chemical particles are spread into the ocean, resulting in devastating impacts to the ecosystem of the world.

Plastic pollution in the ocean comes from virtually everywhere. However, some areas are larger contributors to this issue than others. Five countries in Asia (China, Indonesia, the Philippines, Thailand, and Vietnam) are estimated to account for as much as 60% of the plastic waste entering the ocean.⁵⁸ It has also been estimated that 90% of the plastic polluting our oceans come from just 10 rivers.⁵⁹ Dr. Christian Schmidt, an author from the Helmholtz Centre for Environmental Research, concluded that this was due to the fact that near each of the rivers there is a high population and a less than ideal waste management process. For example, the Yangtze river is the largest carrier of plastic pollution in the ocean. This is due to its river basin being home to almost 500 million people.

Each year over 260 million tonnes of plastic are produced worldwide.⁶⁰ Every year, this number dramatically increases due to a rise in consumerism as well as an increase in the manufacturing of everyday plastic products. In the past 50 years, plastic production has increased from 15 million tonnes in 1964 to 311 million tonnes in 2014, and is expected to double again over the next 20 years.⁶¹ The convenience of plastics is arguably part of the reason plastic waste has become such a global issue. Its availability has encouraged the human population into having a disposable lifestyle. It is estimated that 50% of plastics are used once before being thrown away.⁶² According to a Greenpeace report, over 10% of that plastic ends up in the oceans.⁶³ In 2006, the United Nations Environment Programme estimated that each

⁵⁷ National Ocean Service, "Why should we care about the ocean?"

oceanservice.noaa.gov/facts/why-care-about-ocean.html. Accessed 5 Jan 2019.

⁵⁸ The Inertia. "Study Shows 5 Countries Account For as Much as 60% of Plastic Ocean Pollution." *The Inertia*, 15 Oct.

^{2015,} www.theinertia.com/environment/study-shows-5-countries-account-for-as-much-as-60-of-plastic-ocean-p ollution/. Accessed 4 Jan. 2019.

⁵⁹ Gray, Alex. "90% of Plastic Polluting Our Oceans Comes from Just 10 Rivers." *World Economic Forum*, 8 June 2018, www.weforum.org/agenda/2018/06/90-of-plastic-polluting-our-oceans-comes-from-just-10-rivers/. Accessed 5 Jan. 2019.

⁶⁰ *Plastic Pollution*. plastic-pollution.org/. Accessed 3 Jan. 2019.

⁶¹ Mamidipudi, Athreya. "The Bane of Consumerism." *DownToEarth*, 28 Aug. 2018, www.downtoearth.org.in/blog/waste/the-bane-of-consumerism-61460. Accessed 4 Jan. 2019.

⁶² Taylor-Smith, Kerry. "How Plastic Pollution is Affecting the Ocean Wildlife." *AZO Cleantech*, 16 May 2018, www.azocleantech.com/article.aspx?ArticleID=729. Accessed 5 Jan. 2019.

⁶³ Ibid

square mile of ocean contains over 46,000 pieces of floating plastic.⁶⁴ A more recent study, however, published in 2017, estimated that between 1.15 to 2.41 million tonnes of plastic enters the oceans via rivers annually.⁶⁵

Most of the clothes manufactured are made of synthetic fibers; fibers which are made entirely of chemicals that are harmful to the environment. Synthetic fibers are not biodegradable, unlike natural fibers, and tend to bind with molecules of harmful chemical pollutants found in wastewater, such as pesticides or flame retardants. Plastic is one of these fibers. These fibers make up a large amount of plastic pollution in the oceans because they are small enough to be consumed by wildlife. Studies by the University of Minnesota School of Public Health have shown health problems among plankton and other small organisms that eat microfibers, which then make their way up the food chain. Microplastics are even found in salt and tap water. A recent study showed that more than 80% of saltwater samples collected from over 5 continents tested positive for plastic fibers.⁶⁶ There are also billions of microscopic beads in the ocean known as microbeads. Microbeads are found in things such as face washes, abrasive cleansers, and toothpaste. Their minuscule size allows them to easily pass through water filtration and sewage treatment systems and end up polluting the ocean.

The mass pollution of plastics has devastating effects on marine life. Studies have shown that fish in the North Pacific ingest 12,000 to 24,000 tonnes of plastic each year, causing the fish intestinal injury and death.⁶⁷ It also, however, transfers plastic up the food chain to bigger fish, marine mammals, and human seafood eaters. A recent study found that a quarter of fish at markets in California contained plastic in their guts, mostly in the form of plastic microfibers. This has detrimental health effects to both animals and humans. Toxic chemicals leak out of plastic and are found in the blood and tissue of nearly everyone. Exposure to them is linked to cancers, birth defects, impaired immunity, endocrine disruption, and other ailments.⁶⁸ Denise Hardesty, a senior research scientist at CSIRO, concluded that over 90% of seabirds have pieces of plastic in their stomachs. Recent estimates suggest that at least 267 species worldwide have been affected, including 84% of sea turtle species, 44% of all seabird species and 43% of all marine mammal species. At its current rates plastic is expected to outweigh all the fish in the sea by 2050.⁶⁹

In conclusion, plastic entering the ocean has a major negative impact on the environment due to its permanency, detrimental effects on wildlife, and long-term side effects. However, some action has been taken to prevent the issue. Over 250 of the largest plastic using industries that are responsible for 20% of the plastic packaging produced around the world have committed to reducing waste and pollution. One example of this being Nestlé's recent

⁶⁶ Morrison, Dan, and Chris Tyree. "INVISIBLES: The plastic inside us." Orb Media,

orbmedia.org/stories/invisibles plastics? Accessed 5 Jan. 2019.

68 "Why is plastic harmful?" Plastic Pollution Coalition, Nov. 2018,

⁶⁴ Ferguson, Niall. "Fact: 46,000 pieces of plastic float on each square mile of sea." *The Telegraph*, 6 Aug. 2006, www.telegraph.co.uk/comment/personal-view/3626914/Fact-46000-pieces-of-plastic-float-on-each-square-mile -of-sea.html. Accessed 4 Jan. 2019.

⁶⁵ Griffin, Jenny, and Janaya Wilkins. "Plastic Pollution: The Impact on our oceans and what we can do about it." *SLOACTIVE*, 8 Dec. 2018, sloactive.com/plastic-pollution/. Accessed 4 Jan. 2019.

⁶⁷ "OCEAN PLASTICS POLLUTION: A Global Tragedy for Our Oceans and Sea Life." *Center for Biological Diversity*, www.biologicaldiversity.org/campaigns/ocean_plastics/. Accessed 4 Jan. 2019.

plasticpollutioncoalition.zendesk.com/hc/en-us/articles/222813127-Why-is-plastic-harmful-. Accessed 5 Jan. 2019.

⁶⁹ Ibid

announcement of their goal to make 100% of its packaging recyclable by 2025. Governments have also taken the matter into their own hands with examples being: the EU parliament approving a single-use plastic ban, the U.S. signing a bill to clean up the oceans, and Chile's ban on retail plastic bags. Seattle has become the first U.S. city to ban plastic straws and utensils all together. These are only some of the initiatives being taken. Nonetheless, they are not enough. Our planet needs our oceans and land to survive. As the secretary general himself, Antonio Guterres said, "Refuse what you can't reuse."



Water as a Renewable Source

By: Minal Mirza & Isabella Marsibilio

A renewable resource is one which is naturally occurring and able to replenish itself through recurring processes or biological reproduction over a passage of time. Water, the most vital resource of all, is often considered to be renewable due to its ability to regenerate through the rain cycle. However, the sustainability of this resource is questionable, and it is only in the short term that water can be thought of as a renewable resource. As the effects of climate change worsen, the next few centuries will undoubtedly see drastic shortages of potable water. Only 0.3 percent of freshwater is found in lakes and rivers. As rivers run dry due to rising global temperatures and surface waters become contaminated due to industrial waste, this figure is expected to decrease. For a resource to remain renewable, it must regenerate itself as fast as it is being consumed. This unfortunately is not the case with the world's freshwater reservoirs. As global populations and demand for drinking water increases, surface water reserves are being drained faster than they can replenish themselves. In an attempt to reduce such harmful effects of climate change, research is being conducted to search for a way to use seawater to generate electricity through hydropower technology and to convert salt water into fresh water through desalination processes. Currently, 81% of the total energy used in the United States comes from fossil fuels which generate harmful carbon dioxide emissions. These are not only noxious to air quality, but also a leading cause of Global Warming. In 2014, approximately 78 percent of the United States's global warming emissions were energy-related.⁷⁰ Advancements in hydropower technology would allow reduced carbon dioxide emissions, thus curtailing the rate at which temperatures rise across the globe and preventing potential droughts in several nations.

Hydropower is the process of using water to generate electricity. These plants, which must be located on water, can be powered by steam, river movement, or the movement of water in municipal pipes. Electricity is produced by channeling moving water to power electric generators. The flow of moving water determines the amount of energy available. Many hydropower plants benefit from several storage schemes, and in some river systems a number of power stations are positioned in a cascade one after the other, so that the water's energy can be exploited several times before it finally flows out into the sea. Inside the power station, the water drives a turbine, whose mechanical energy is turned into electrical energy in the generator. Hydropower is a highly flexible energy source, since the water can be stored in the reservoirs until needed.⁷¹ In the United States, at both the Niagara Falls and the Columbia River, a *run-of-the-river system is used*. Water flows through a pipe, or *penstock*, the force of the current pushes against blades and puts pressure on a turbine, which spins a generator and produces electricity.⁷² In a *storage system*, water accumulates in reservoirs created by dams

⁷⁰ "The Hidden Costs of Fossil Fuels." Union of Concerned Scientists,

www.ucsusa.org/clean-energy/coal-and-other-fossil-fuels/hidden-cost-of-fossils#.XEqgOM9KhmA. ⁷¹ "Hydropower Briefly Explained." *Peru* | *Statkraft*,

www.statkraft.com/energy-sources/hydropower/hydropower-briefly-explained/.

⁷²Factors Affecting Gasoline Prices - Energy Explained, Your Guide To Understanding Energy - Energy Information Administration, www.eia.gov/energyexplained/print.php?page=hydropower_home.

and is released as needed to generate electricity. The primary benefit of electricity production through Hydropower is that it produces no air pollutants, and shows the best Greenhouse Gas emission performances of all power generation technologies.⁷³ This is an extremely important factor, since the stabilization of GHG emissions is one of the greatest environmental challenges facing the world today.

In addition to the advances being made in the field of hydropower technology, research is being conducted into water desalination processes as well. Water desalination separates salts and other minerals from seawater and waste water, thus allowing the production of potable water from a source that would otherwise be unsafe for human consumption. Seawater desalination has the potential to reliably produce enough potable water to support large populations located near coastlines. Numerous seawater desalination plants are currently under construction near the coast of California.⁷⁴ The development of such desalination projects will be crucial for water security in the coming years as freshwater availability is expected to decline. However, this technology is energy intensive and research is needed to improve efficiency and reduce energy consumption.

Currently, more than 25 countries in the world depend on hydropower for 90 percent of their electricity supply (99.3 percent in Norway), and 12 countries are 100 percent reliant. Hydropower also produces a large share of electricity in 65 countries and is used at some level by more than 150 countries. Canada, China, and the United States have the largest hydropower generation capacity. In the United States; Idaho, Washington, and Oregon get the majority of their electricity from hydropower.⁷⁶ The National Hydropower Association says that hydropower generation benefits consumers through lower electricity costs as prices don't depend on unpredictable changes in fuel costs. Hydropower also shows the lowest levelized cost of electricity across all major fossil fuel and renewable energy sources. In addition, it actually costs less than other energy efficient options, according to a recent study from Navigant Consulting and the American Council on Renewable Energy.⁷⁶

Developing countries are planning to dramatically expand hydroelectric power generation in their desperate need for electricity and irrigation. Not only do such countries use their own resources without breaking the bank, hydropower is proven to provide low-carbon, long-term, reliable electricity generation.⁷⁷ Over 620 hydroelectric dams are presently under construction and some 3,000 are planned for the near-future. Most of this hydropower development is taking place in Latin America and Asia. Concerning future development in the U.S., the NHA contends hydropower is the nation's most available, reliable, affordable, and sustainable energy source. The basic requirement calls only for the power of moving water,

⁷³ "Hydropower Briefly Explained." *Peru* | *Statkraft*,

www.statkraft.com/energy-sources/hydropower/hydropower-briefly-explained/.

⁷⁴ American Membrane Technology Associations (AMTA), www.amtaorg.com/Water_Desalination_Processes.html.

⁷⁵ "Hydropower Costs | Renewable Energy Hydroelectricity Costs vs Other Renewable & Fossil Costs." *PlanetSave*, 9 Mar. 2016,

planetsave.com/2016/03/09/hydropower-costs-renewable-energy-hydroelectricity-costs-vs-renewable-fossil-costs/. ⁷⁶ "Hydropower Costs | Renewable Energy Hydroelectricity Costs vs Other Renewable & Fossil Costs." *PlanetSave*,

⁷⁶ "Hydropower Costs | Renewable Energy Hydroelectricity Costs vs Other Renewable & Fossil Costs." *PlanetSave*, 9 Mar. 2016,

planetsave.com/2016/03/09/hydropower-costs-renewable-energy-hydroelectricity-costs-vs-renewable-fossil-costs/. ⁷⁷ "Hydropower Costs | Renewable Energy Hydroelectricity Costs vs Other Renewable & Fossil Costs." *PlanetSave*,

⁹ Mar. 2016,

planetsave.com/2016/03/09/hydropower-costs-renewable-energy-hydroelectricity-costs-vs-renewable-fossil-costs/.

whether it happens to be rivers, streams, or ocean tides. *Forbes'* calculations show the current level of worldwide hydropower development will require about \$3 trillion in investment to produce about 60 trillion kWh of electricity by mid-century. This would provide irrigation water and sufficient power to raise almost a billion people up out of abject poverty, and would avoid 50 billion tons of carbon emissions from entering the atmosphere.⁷⁸

Advances in technology such as hydropower and desalination are essential for future water security. With temperatures rising due to Global Warming, freshwater reservoirs are expected to slowly evaporate. Paired with an increasing world population, the coming years could be characterized by severe water shortages. However, investment into research and development of desalination projects could curtail the effects of freshwater scarcity. These projects would allow countries to produce potable water from oceans, seas, and wells. Additionally, the development of hydropower plants will reduce the worlds dependency on fossil fuels for energy production, and provide a much more ecologically sustainable alternative.

⁷⁸ "Hydropower Costs | Renewable Energy Hydroelectricity Costs vs Other Renewable & Fossil Costs." *PlanetSave*, 9 Mar. 2016,

planetsave.com/2016/03/09/hydropower-costs-renewable-energy-hydroelectricity-costs-vs-renewable-fossil-costs/.

HYDROPOWER

HYDROPOWER IS USED ALL OVER THE WORLD!



was put in place.

Arctic Sea: How will the melting of the Arctic affect the surrounding communities?

By: Kresten Due

The Arctic Ocean's ice is thawing. Data has shown that there has been a steady average decline in the surface area of the Arctic Ocean's ice. In December 2018, the ice coverage was about 4.6 million square miles, which is about 980,000 square miles less than the average in December between 1981 and 2010.⁷⁹ Although rising sea levels are posing a threat to both wildlife and humans, the melting of the Arctic will facilitate trade and make accessing natural resources easier.

The thawing of the ice could potentially lead to the establishment of a third Central Arctic Shipping Route besides the existing Northeast Passage that follows the Russian coastline to/from Murmansk (Russian Federation) and Kirkenes (Norway) and the Northwest Passage that follows the Canadian and U.S. coastline to/from Baffin Bay.⁸⁰ This third shipping route would lead directly through the Arctic Ocean.

Various estimates have been made to measure the extent to which trade will increase following different climate prediction models.⁸¹ Even if countries adhere to the Paris agreement of low emissions, by mid-century already 40% of the days in September would be navigable through the Arctic Ocean instead of currently 20%. By late century, the number of days would increase to about 50%. If countries do not lower emissions and instead adhere to "business as usual," by midcentury the Arctic Ocean will be navigable an estimated 75% of the days in September. By late century, the number of days in September will increase to almost 100%. This means a significant increase in shipping potential.

The above predictions highlight a key development of the Arctic sea melting: cheaper trade. The thawing of the Arctic sea will allow for more OW (open-water) vessels to sail across the sea. These tend to be significantly cheaper than the alternative PC6 (Polar Class 6), vessels that are built to navigate through sea ice. The economic benefits to both arctic and non-arctic nations would be great. More accessible shipping routes in the Arctic will likely increase trade between arctic and non-arctic nations. The shipping route from Yokohama to Rotterdam via the Suez Canal is about 11,200 nautical miles long. However, ships using the Arctic route only have to travel 6,500 nautical miles. The shorter distance would cut the travel time by about two

⁷⁹ "National Snow and Ice Data Center." Animals and Frozen Ground | National Snow and Ice Data Center, 7 Jan. 2019, nsidc.org/arcticseaicenews/.

⁸⁰ Øystein, Jensen. " Opening Of New Arctic Shipping Routes." *Panama and Suez Canal Routes*, 11 Jan. 2012, portlets.arcticportal.org/hub-ports/92-hub-ports.

⁸¹ Melia, Nathanael. "Future of the Sea: Implications from Opening Arctic Sea Routes." *Government Office for Science*, July 2017,

assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/634437/Future_of_the_sea_-_implications_from_opening_arctic_sea_routes_final.pdf.

weeks.⁸² In 2017, about 9.7 million tons of cargo were shipped on the Northeast Passage. By 2024, the Russian government hopes to increase the number to 80 million tons.⁸³

In addition to the creation of a new trade route, an ice-free Arctic will make it easier and cheaper to extract vast oil and natural gas resources from this area. It is estimated that the Arctic holds about 22% of the Earth's supplies with 87% (or 360 billion barrels oil equivalent) still unexplored in seven main arctic bases. The exploration is currently costly because special equipment is needed to operate in icy conditions.⁸⁴ Besides oil and gas, the Arctic sea holds minerals such as apatite, ceramic raw materials, coal, cobalt, copper, diamonds, gold, gypsum, iron, lead, mica, molybdenum, nickel, platinum, rare earth elements, titanium, palladium, salt, silver, tin, uranium, and zinc. In October 2018, a moratorium (Central Arctic Ocean Agreement) on commercial fishing in large parts of the Arctic was signed by the USA, Russia, Canada, Norway, Denmark, Iceland, Japan, South Korea, China, and the EU to allow time for further evaluation of the ecosystem.⁸⁵

The territorial rights concerning the Arctic sea are complicated. Much of the area is claimed by the Russian Federation, Iceland, Norway, Denmark, the U.S., and Canada. Claims are also made for areas beyond the exclusive economic zone of 200 nautical miles agreed upon in the United Nations Convention on the Law of the Sea with reference to the continental shelf.⁸⁶ Other stakeholders in the region, some of which have observer status in the Arctic Council, will likely have minimal rights in the Arctic other than shipping. Military presence, especially from large nations such as Russia and the USA, has expanded in recent years.⁸⁷ Security experts believe the USA, for example, would significantly need to expand its Arctic military presence in order to keep up with that of Russia.

The use of the Arctic Ocean is regulated by the United Nations Convention on the Law of the Sea.⁸⁸ In addition, the Arctic Council is an intergovernmental forum "promoting cooperation, coordination and interaction among Arctic States, Arctic indigenous communities and other Arctic inhabitants."⁸⁹ The Arctic Council has eight Member States: Canada, Denmark, Finland, Iceland, Norway, the Russian Federation, Sweden, and the USA. As major stakeholders, indigenous peoples' groups are Permanent Participants in the Arctic Council. These include the Aleut International Association, the Arctic Athabaskan Council, Gwich'in Council International, the Inuit Circumpolar Council, the Russian Association of Indigenous

⁸² "The Complexities of Arctic Maritime Traffic." *The Arctic Institute*, 16 June 2018, www.thearcticinstitute.org/complexities-arctic-maritime-traffic/.

⁸³ "As Arctic Ice Melts, New Energy Shipping Trade Route Opens." *Insurance Journal*, 30 Aug. 2018, www.insurancejournal.com/news/international/2018/08/30/499650.htm.

⁸⁴ King, Hobart. "Oil and Natural Gas Resources of the Arctic." Geology, geology.com/articles/arctic-oil-and-gas/.

⁸⁵ Harvey, Fiona. "Commercial Fishing Banned across Much of the Arctic." The Guardian, Guardian News and Media, 3 Oct. 2018,

www.theguardian.com/environment/2018/oct/03/commercial-fishing-banned-across-much-of-the-arctic.

⁸⁶ Masters, Jonathan. "The Thawing Arctic: Risks and Opportunities." Council on Foreign Relations, Council on Foreign Relations, 16 Dec. 2013, www.cfr.org/backgrounder/thawing-arctic-risks-and-opportunities.

⁸⁷Gramer, Robbie. "Here's What Russia's Military Build-Up in the Arctic Looks Like." Foreign Policy, Foreign Policy, 25 Jan. 2017,

foreignpolicy.com/2017/01/25/heres-what-russias-military-build-up-in-the-arctic-looks-like-trump-oil-military-hig h-north-infographic-map/.

⁸⁸ United Nations Convention on the Law of the Sea.

www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf.

⁸⁹ "SDWG Meeting." Arctic Council, 20 May 2015, arctic-council.org/index.php/en/about-us.

Peoples of the North, and the Saami Council. The main focus of the work of the Arctic Council is sustainable development and the environmental protection of the Arctic. The Arctic Council, being a forum, is dependent on financial contributions and programming from its Member States. The rights of the Indigenous People are further strengthened by the United Nations Declaration on the Rights of Indigenous People,⁹⁰ which grants them among other things control over their traditional land, territories, and resources (Articles 8-10, 26-32).

In conclusion, though the other externalities, including rising sea levels, may be less mertiable, the thawing of the Arctic will undoubtedly be an economic boom, opening shipping routes and leading to cheaper international trade. That being said, the key stakeholders in the Arctic will expand beyond members of the Arctic Council, possibly exacerbating geopolitical tensions concerning exclusive economic zones, strategic resources, trade, and even military presence.

⁹⁰ United Nations Declaration on the Rights of Indigenous Peoples. 13 Sept. 2007, www.un.org/development/desa/indigenouspeoples/wp-content/uploads/sites/19/2018/11/UNDRIP_E_web.pdf.



Territorial Disputes: Conflicts and Collaboration

By: Minal Mirza

Overlapping claims to freshwater resources generate international disputes in various regions of the world. With limited availability, several countries are forced to share watersheds (the watersheds of 261 major rivers are shared by two or more countries at the moment).⁹¹ This situation gives rise to disputes as governments recognize that the availability of freshwater impacts the living and economic conditions of their countries, and seek to monopolize these resources. Not only do these resources generate vital drinking water, but also they are used for irrigation and energy generation. Due to the absolute necessity, ever rising scarcity, and unequal distribution amongst political borders, claims to freshwater resources are at the forefront of global water disputes.

Freshwater rivers that run through international borders often cause disputes as some nations use more of the rivers water than others, and questions arise over the equal distribution of the water. The Tigris-Euphrates River Basin is one such example. It consists of two primary freshwater rivers originating in Southern Turkey, the Tigris and the Euphrates. The Tigris flows for 32 kilometres along the Turkey-Syria border, before flowing south through Irag. The Euphrates flows into Syria from the north, before continuing on through Irag. Both the rivers meet in Iraq to form the Shatt Al-Arab, which flows south into the Persian Gulf.⁹² Political tensions in this region have existed for centuries; however, a rapid increase in population in the 1960s led each country to pursue unilateral development of water resources. From 1965 to 1973, Turkey built the Keban Dam in southern Anatolia and Syria built the Tabga Dam. Despite bilateral negotiations, no formal agreements were in place when the two dams opened in 1973. After the dams became operational, the flow of water reaching Irag substantially decreased and the government requested an intervention by the Arab League. Hostile statements were exchanged between Irag and Syria, and Syria withdrew from the league committee tasked with resolving this dispute. In May 1975, Syria closed its airspace to Iraqi flights and both countries amassed troops on their borders as political tension heightened. The situation was defused after Saudi Arabian intervention, and both sides arrived at an agreement. The terms of this agreement were never made public, but it is speculated that Syria was permitted to keep 40% of the water in the Euphrates flowing through its country, while 60% of the water was to be allowed to flow south through Irag. Talks were held again in 1990 when Turkey shut off the flow of the Euphrates for 30 days by closing the Ataturk Dam. Irag insisted that Turkey allow a minimum of 500 million cubic meters per year (mcm/y) to pass into Syria, but negotiations were suspended due to the outbreak of the first Gulf War.⁹³ Negotiations after the war failed to reach an agreement, and The Southeastern Anatolia Project continues to be a source of political tension.

⁹¹ "Water Conflicts: Fight Or Flight? | | Allianz Knowledge." Archive.fo, 29 Aug. 2008, archive.fo/20080829171957/http://knowledge.allianz.com/en/globalissues/climate_change/natural_disasters/w ater_conflicts.html.

⁹² Wolf, Aaron T. "Middle East Water Conflicts and Directions for Conflict Resolution." Usaid.gov, pdf.usaid.gov/pdf_docs/PNABY541.pdf.

⁹³ Wolf, Aaron T. "Middle East Water Conflicts and Directions for Conflict Resolution." Usaid.gov, pdf.usaid.gov/pdf_docs/PNABY541.pdf.

Similarly, there are disputes over the Mekong River in Vietnam between China and the Southeast Asian states of Thailand, Vietnam, Cambodia, Myanmar and Laos. Up to 60 million people directly depend on the river for potable water, food, and mineral-rich soil, and it supports the farming industry of Thailand and Vietnam, the world's largest producers of primary commodities such as rice.⁹⁴ The Mekong River is currently experiencing the most severe drought and salinity intrusion in 100 years, which can be attributed to the operation and construction of mega-dams along the river as well as water diversion for agricultural purposes. China completed the production of six large-scale dams in the area, producing about 15,000 megawatts per year, and plans to demolish 15 small-sized land features spread across the river. ⁹⁵ These projects are causing tension across the region as excessive dam building negatively affects fisheries stocks and transforms the predictability of water flow and downstream movement of silt for fertilising agricultural lands. It also affects the availability of water in places such as the Tonle Sap, the largest freshwater lake in the region. With no diplomatic treaties in place, the region could see heightened geopolitical tensions and possibly direct conflict. The tension is further heightened as climate change proves disruptive across agricultural Asia. Resource competition and water wars could become more prevalent and have greater political repercussions. This highlights the need for multilateral diplomatic efforts to peacefully manage the dispute. A 1996 agreement on cooperation for the sustainable development of the Mekong basin, signed among Southeast Asian littoral states, provides a framework for institutionalised cooperation and stipulates that parties should refrain from unilateral activities which imperil the rights and developmental interests of neighbours and undermine the area's ecological sustainability.⁹⁶ However, a diplomatic treaty signed amongst the affected states could suppress tensions and ensure political stability in the region. The establishment of the Lancang-Mekong Cooperation mechanism, which involves China and Southeast Asian littoral states, is a step in the right direction. It provides a much-needed platform for all parties to arrest the brewing conflict and adopt necessary mitigation and adaptation measures for affected communities.

The conflict between Israel and the State of Palestine is about land and the water that flows through that land. The Six-Day War in 1967 arguably originated from a water dispute (the diversion of the Jordan River, Israel's main source of drinking water). In the 1967 war, Israel gained exclusive control of the waters of the West Bank and the Sea of Galilee. These resources account for 60% of the freshwater in Israel. The mountain aquifer in this region is also highly disputed. Israel takes up about 80% of the aquifer flow, leaving the State of Palestine with 20%.⁹⁷ Israel claims its water usage has not significantly changed since the 1950s, and that the

⁹⁴ "Proactive Diplomacy in Mekong Row Only Way to Resolve Conflict." South China Morning Post, South China Morning Post, 14 Jan. 2018,

www.scmp.com/news/china/policies-politics/article/proactive-diplomacy-mekong-river-dispute-only-way.

⁹⁵ "Proactive Diplomacy in Mekong Row Only Way to Resolve Conflict." South China Morning Post, South China Morning Post, 14 Jan. 2018,

www.scmp.com/news/china/policies-politics/article/proactive-diplomacy-mekong-river-dispute-only-way. ⁹⁶ "Proactive Diplomacy in Mekong Row Only Way to Resolve Conflict." *South China Morning Post*, South China Morning Post, 14 Jan, 2018.

⁹⁷ Asser, Martin. "Obstacles to Arab-Israeli Peace: Water." *BBC News*, BBC, 2 Sept. 2010,

www.bbc.com/news/world-middle-east-11101797.

rain which replenishes the aquifer happens to fall on their side, but the water does flow down.98 The State of Palestine's government claims that they are prevented from using their own water resources by a belligerent military, forcing hundreds of thousands of people to buy water from their occupiers at inflated prices.⁹⁹ Additionally, Israel allocates to its citizens, including those living in settlements in the West Bank, deemed illegal under international law, between three and five times more water than the people of the State of Palestine. They say this is crippling to their agricultural economy. During the era of Arab-Israeli peacemaking in the 1990s, water rights emerged as one of the most complex areas of discussion, and were set aside to be dealt with in the "final status" talks between Israel and the State of Palestine, which were never concluded.¹⁰⁰ Former UN Secretary General Boutros Boutros-Ghali said in the 1990s that the next war in the Middle East would be about water not politics. Demand for water outstrips supply in this region, and as requirements rise current supply is proving to be unsustainable. Experts say that improving the political atmosphere would allow supplies to be piped from neighbouring countries, and investment in desalination and other technical advances are crucial. Such solutions are desperately needed since water requirements for nations are interdependent, but resources cross political borders.

The United Nations estimates around 1.2 billion people are currently living in areas with water scarcity and that by 2025 two-thirds of the world's population could be living in "water stressed conditions."¹⁰¹ Therefore, it is understandable that there are many disputes and conflicts over claims to freshwater resources. However, research from the International Water Management Institute and Oregon State University finds cooperation is more likely than conflict, with hundreds of transboundary agreements and treaties in place around the world.¹⁰² Governments try to avoid conflict as much as possible in order to maintain their diplomatic relations and regional interests, so the use of agreements and treaties is both common and effective in dealing with water disputes. More than 3,600 water treaties and agreements are in place across the globe. For example, the Boundary Waters Treaty of 1909 between the United States and Canada establishes regulations to prevent and resolve disputes over boundary waters. The Columbia River Treaty is a 1964 agreement between the U.S. and Canada on the development and operation of dams in the upper Columbia River basin for power and flood control benefits in both countries. The Treaty of Zandhoven was signed in 1833 between the Netherlands and Belgium. It established special regulations over the use of the Meuse River and helped to re-establish bilateral relations between the Netherlands and Belgium.¹⁰³

⁹⁸ Asser, Martin. "Obstacles to Arab-Israeli Peace: Water." *BBC News*, BBC, 2 Sept. 2010, www.bbc.com/news/world-middle-east-11101797.

⁹⁹ Asser, Martin. "Obstacles to Arab-Israeli Peace: Water." *BBC News*, BBC, 2 Sept. 2010, www.bbc.com/news/world-middle-east-11101797.

¹⁰⁰ Asser, Martin. "Obstacles to Arab-Israeli Peace: Water." *BBC News*, BBC, 2 Sept. 2010, www.bbc.com/news/world-middle-east-11101797.

¹⁰¹ "California's Water Wars." SBS News, SBS News, 25 Jan. 2019,

www.sbs.com.au/news/dateline/tvepisode/california-s-water-wars.

¹⁰² "Water Conflict." Golden Screen Cinemas,

ipfs.io/ipfs/QmXoypizjW3WknFiJnKLwHCnL72vedxjQkDDP1mXWo6uco/wiki/Water_conflict.html.

¹⁰³ "Water Cooperation for a Secure World." Strategic Foresight, 2013,

www.strategicforesight.com/publication_pdf/20795water-cooperature-sm.pdf.

Similarly, in a rare display of regional cooperation, representatives of Israel, Jordan and the State of Palestine's Authority agreed to building a Red Sea-Dead Sea water project that benefits all three nations. The project addresses shortage of freshwater in the region and the quick contraction of the Dead Sea. A new desalination plant is to be built in Jordan to convert salt water from the Red Sea into fresh water for use in southern Israel and southern Jordan—each would get eight billion to 13 billion gallons a year.¹⁰⁴ Under the agreement, Israel will also provide Amman, the Jordanian capital, with eight to 13 billion gallons of fresh water from the Sea of Galilee in northern Israel, and the people of the State of Palestine will be able to buy up to eight billion gallons of fresh water from Israel.¹⁰⁵ The organization's Jordanian director, Munqeth Mehyar, said in a statement, "What is being signed today is a conventional desalination project, albeit with a regional perspective."

Due to the vitality and scarce nature of water, freshwater resources are highly sought after and often generate international conflicts. These conflicts can have long lasting impacts on political and diplomatic relations between countries. For example, the conflict over the Tigris-Euphrates River Basin in the Middle East, the Mekong River in Vietnam, and the water disputes between Israel and the State of Palestine have each caused animosity between the involved countries, and accords are yet to be signed. However, research shows that international disputes over water are increasingly likely to be resolved through the use of diplomatic treaties and bilateral accords, as was the case in the Boundary Waters Treaty, the Columbia River Treaty, the Treaty of Zandhoven, and recently the Red Sea-Dead Sea water project.

¹⁰⁴ Nytimes.com. (2019). A Rare Middle East Agreement, on Water. [online] Available at:

https://www.nytimes.com/2013/12/10/world/middleeast/israel-jordan-and-palestinians-sign-water-project-deal.h tml [Accessed 25 Jan. 2019].

¹⁰⁵ Nytimes.com. (2019). A Rare Middle East Agreement, on Water. [online] Available at: https://www.nytimes.com/2013/12/10/world/middleeast/israel-jordan-and-palestinians-sign-water-project-deal.h tml [Accessed 25 Jan. 2019].

TIGRIS-EUPHRATES RIVER BASIN

TURKEY, SYRIA AND IRAQ



Population growth in the '60s prompts DEVELOPMENT OF WATER RESOURCES

····· ·····

Reduced FLOW OF WATER to Iraq



Syria CLOSED ITS AIRSPACE to Iraqi flights



Syria and Iraq AMASSED TROOPS on borders



NEGOTIATIONS SUSPENDED.

THE MEKONG . RIVER

THAILAND, CAMBODIA, VIETNAM, MYANMAR, LAOS & CHINA



LANCANG-MEKONG COOPERATION MECHANISM aims to address MITIGATION/ ADAPTATION measures

Climate Refugees: How will water-related problems cause a displacement of people?

By: Paloma Delgado

According to the United Nations High Commissioner for Refugees (UNHCR), a refugee is defined as "someone who has been forced to flee his or her country because of persecution, war or violence."¹⁰⁶ Under this definition, there are currently 65.6 million refugees worldwide.¹⁰⁷ Out of those, 24 million are internally and externally displaced due to climate related causes, primarily rising sea levels that have lead to nation wide inundations.¹⁰⁸ Since 2000, there has been a 250% increase in yearly flooding within the USA alone.¹⁰⁹ While these people are clearly being displaced from their homes and qualify as refugees, there is no formal definition for as to what constitutes as a climate refugee. This lack of formal recognition excludes them from the protection of international refugee law.

The main water related consequences of climate change are rising sea levels, ocean acidification, changes in precipitation patterns, droughts, and increased propensity of hurricanes. Rising sea levels is the most commonly mentioned driver behind displacement due to climate change, as some previously inhabitable cities, nations, and countries, are now being flooded. 634 million people worldwide are at risk of displacement due to this. It is important to note that currently 1 in 10 persons lives in a coastal area around the world.¹¹⁰ The countries most prone to high levels of displacement are those found in Southeast Asia, including India, Vietnam, Indonesia, and Bangladesh. In Bangladesh alone, hundreds of thousands of people are forcibly displaced every year due to coastal flooding.¹¹¹

However, climate refugees will not be exclusive to one specific continent; the city of Miami is already under the threat of submerging, with year round flash floods already taking place.¹¹² Not only do these floods have the potential to cause irreparable damage to road systems, homes, tunnels, etc, but also they pose a threat of contamination to local drinking sources. These combined will potentially make certain areas in Miami uninhabitable, and eventually, the city will be likely underwater. With that being said, the people of Miami will be forced to move to other parts of Florida, or even to other states within the USA.

¹⁰⁶ UNHCR. "What Is a Refugee." *UN Refugees*, www.unrefugees.org/refugee-facts/what-is-a-refugee/. Accessed 23 Jan. 2019.

¹⁰⁷ UNHCR. "Figures at a Glance." *United Nations High Commissioner for Refugees*, UNHCR, www.unhcr.org/figures-at-a-glance.html. Accessed 23 Jan. 2019.

¹⁰⁸ McDonnell, Tim. "The Refugees the World Barely Pays Attention to." *National Public Radio*, NPR, 20 June 2018, www.npr.org/sections/goatsandsoda/2018/06/20/621782275/the-refugees-that-the-world-barely-pays-attention -to. Accessed 23 Jan. 2019.

¹⁰⁹ Jochem, Greta. "NOAA: Like 2017, 2018 Will Be a Record Year for Floods." *Grist*, 2 June 2018, grist.org/article/noaa-like-2017-2018-will-be-a-record-year-for-floods/. Accessed 23 Jan. 2019.

¹¹⁰ Greenfield Boyce, Nell. "Study: 634 Million People at Risk from Rising Seas." *National Public Radio*, NPR, www.npr.org/templates/story/story.php?storyId=9162438. Accessed 23 Jan. 2019.

¹¹¹ Environmental Justice Foundation. "Climate Displacement in Bangladesh."*Environmental Justice Foundation*, ejfoundation.org/reports/climate-displacement-in-bangladesh. Accessed 23 Jan. 2019.

¹¹² Loria, Kevin. "Miami Is Racing against Time to Keep up with Sea-level Rise." *Business Insider*, 12 Apr. 2018, www.businessinsider.com/miami-floods-sea-level-rise-solutions-2018-4. Accessed 23 Jan. 2019.

The country of Kiribati in the Pacific Ocean is another prime example of the consequences of climate change on involuntary migration. With a population of 119,548, Kiribati is a small island republic found in Oceania which is already being submerged.¹¹³ By 2050, the world bank suggested that half of the island of Bikenibeu, within Kiribati, would be fully inundated.¹¹⁴ Similar to Miami, Kiribati faces year round floods, which oftentimes wash away causeways, contaminate their potable water, and overall wreck havoc on their already fragile economy. Moreover, warming sea temperature have been causing coral reefs surrounding the island republic to degrade, which allows stronger waves to slam into the coasts. This would further promote erosion and potentially disrupt their food supply, given that most of the fish they consume is found in the fragile environments within coral reefs. The country is suffering greatly on all fronts due to the effects of climate change, which makes it highly difficult and, in some places, impossible to live in. Kiribati's government has acknowledged the threat of climate change and has taken steps to reallocate their citizens. Recently, the government bought around 6000 acres of land in Fiji, a neighboring island, in order to repopulate with Kiribati's climate refugees.¹¹⁵ Besides that, they have been urging their people (primarily those with employable work skills) to leave the islands before it's too late.

While there are some clear similarities between Kiribati and Miami, it is imperative to note that Kiribati is considered a low income country. Kiribati's Gross Domestic Product (GDP) is 196.2 Million USD, whereas the USA has a GDP of 19.2 Trillion USD.¹¹⁶ Many of the people found within the islands do not have the means to migrate or to start a new life. For the people of Miami, it would be much easier to escape the consequences of rising sea levels. This contrast brings up an important concept, which is that of climate justice.

Climate justice refers to the act of holding those most responsible for climate change, and providing justice to those most affected.¹¹⁷ Core countries (or higher income countries) are the main enablers of climate change given their increased use of fossil fuels and other heavy contaminants. However, those most affected are the people within the periphery countries, in other words–low income people.

We see the inequitable effects of climate change again in many sub saharan countries. Countries such as Côte d'Ivoire, Sudan, and South Africa are currently experiencing "water stress", which refers to economic, social, and political problems caused by the lack of water.¹¹⁸ In simple terms, water stress refers to the effects of droughts or water restrictions on a population. Côte d'Ivoire split some years ago in a conflict between the north and south, a conflict which resulted in some people being unable to access water due to unpaid water bills,

¹¹³ "Kiribati Population 2019." Wrold Population Review, 2019,

worldpopulationreview.com/countries/kiribati-population/. Accessed 23 Jan.2019.

¹¹⁴ McDonnell, Tim. "The Refugees the World Barely Pays Attention to." *National Public Radio*, NPR, 20 June 2018, www.npr.org/sections/goatsandsoda/2018/06/20/621782275/the-refugees-that-the-world-barely-pays-attention -to. Accessed 23 Jan. 2019.

¹¹⁵ Ives, Mike. "A Remote Pacific Nation, Threatened by Rising Seas." New York Times, 2 July 2016,

www.nytimes.com/2016/07/03/world/asia/climate-change-kiribati.html. Accessed 23 Jan. 2019

¹¹⁶ Trading Economics. "Kiribati GDP." *Trading Economics*, 2019, tradingeconomics.com/kiribati/gdp. Accessed 23 Jan. 2019.

¹¹⁷ Mary Robinson Foundation. "Principles of Climate Justice." Mary Robinson Foundation Climate Justice, www.mrfcj.org/principles-of-climate-justice/. Accessed 23 Jan. 2019.

¹¹⁸ Tatlock, Christopher W. "Water Stress in Sub Saharan Africa." *Council on Foreign Relations*, 3 Aug. 2006, www.cfr.org/backgrounder/water-stress-sub-saharan-africa. Accessed 23 Jan. 2019.

as the diminishing water supply caused a rise in prices. This led to an increase in the risk of people getting cholera, as they would get their supply from questionable, unsanitary water sources. This past summer, various South African cities suffered from an incredible shortage of potable water, brought upon by a statewide drought, as well as the mismanagement of the limited supply on behalf of the government. Prior to this summer, 35% of Durban's water was accessed through illegal means due to its inaccessibility¹¹⁹. In Cape Town the 4 million people had to line up at water distribution centers to collect rations of water each day¹²⁰. Eventually, these countries along with others will face even more severe droughts, potentially leading to an increase of climate refugees in the search for water.

Overall, climate change is having a clear adverse effect on the world's refugee population. Floods, droughts, ocean acidification, and more are now leading causes for the internal and external displacement of people all over the world, particularly that of the most economically vulnerable. These people are currently carrying the burden of the climate change, while the ones mostly responsible for it continue to live mostly in peace.

¹¹⁹ The Water Project. "Water in Crisis - South Africa." *The Water Project*,

thewaterproject.org/water-crisis/water-in-crisis-south-africa. Accessed 23 Jan. 2019.

¹²⁰ Welch, Craig. "Why Cape Town Is Running out of Water, and Who's Next." *National Geographic*, 5 Mar. 2018, news.nationalgeographic.com/2018/02/ cape-town-running-out-of-water-drought-taps-shutoff-other-cities/. Accessed 23 Jan. 2019.



Moving Right: What is the correlation between climate refugees and the rise of right-wing politicians?

By: Isabelle Jaber

With the effects of climate change–especially the effects related to water issues–becoming ever prevalent, a new World Bank Report has concluded that the rise in climate refugees will increase with more than 143 million people.¹²¹ Climate refugees, also known as environmental refugees, include people who must leave their existing communities due to the effects of climate change and global warming caused naturally and by anthropogenic activities. The recent increase in climate refugees has also translated into the rise of the far-right in Europe and the Americas.

A study was published recently in the journal *Science*, initiated and largely funded by the EU's Joint Research Centre, with contribution from the U.S. Department of Energy, and led by scientists at Columbia University in New York. The authors of the study examined asylum applications in the EU from 103 countries between 2000 and 2014, during which applications averaged more than 350,000 a year. They compared the applications with information on environmental factors, such as temperature and weather, and adjusted the data for factors such as conflict and political turmoil. In doing so, they spotted a trend correlating with weather and changes in the number of asylum applications. For instance, countries with average temperatures around 20°C – the optimum for temperature for growing many crops – show a higher number of applications, while there are fewer asylum seekers from areas with cooler temperatures.¹²²

The rapid rate of European immigration has breathed life into far-right political movements. Throughout Europe, anti-immigrant rhetoric has been used to fuel the campaigns of far-right, nationalist, political parties. Formed just five years ago, in 2017 the far-right Alternative for Germany (AfD) entered the federal parliament for the first time. Since its founding, it has pushed for strict anti-immigrant policies and tapped into anxieties over the influence of Islam. Their success has been seen as a sign of discontent with Chancellor Angela Merkel's "open-door" policy for refugees. At the height of the migrant crisis, Ms. Merkel lifted border controls and almost a million people arrived in 2015, many of them who are Muslims from Syria, Iraq, and Afghanistan. A far-right party in neighboring Austria has seen even greater success than the AfD. Meanwhile, in Germany, the migrant crisis is also seen as key to their success, and an issue they long campaigned on. Conservative Chancellor Sebastian Kurz vowed a hard-line on immigration; during the campaign, the FPÖ even accused him of stealing their policies. In Sweden, the anti-immigration Sweden Democrats (SD) made significant gains in the 2018 general election in which they won about 18% of the vote, up from 12.9% last time.

¹²¹ Parker, Laura. "143 Million People May Soon Become Climate Migrants." National Geographic, National Geographic Society, 19 Mar. 2018,

news.nationalgeographic.com/2018/03/climate-migrants-report-world-bank-spd/.

¹²² Harvey, Fiona. "Devastating Climate Change Could Lead to 1m Migrants a Year Entering EU by 2100." The Guardian, 21 Dec. 2017,

www.theguardian.com/environment/2017/dec/21/devastating-climate-change-could-see-one-million-migrants-a -year-entering-eu-by-2100. Accessed 17 Jan. 2019.

The center-left Social Democrat party of Prime Minister Stefan Lofven have also notably seen support ebb away. The Social Democrats are a party associated with generous social welfare and tolerance of minorities, while the SD opposes multiculturalism and wants strict immigration controls. This increase in the popularity of far-right, nationalist political parties can be seen in many countries in Europe. For instance, in Hungary, Viktor Orban won 133 out of 199 seats for the far-right Fidesz-KDNP party.¹²³ While in Slovenia, they are continuing to use anti-immigration rhetoric to increase their popularity as anti-immigrant Slovenian Democratic Party (SDS) was the largest party in 2018's general election.¹²⁴ As for Italy, the new government has maintained the same anti-migrant measures, which were campaigned, where immigration reforms have spread through the upper house of parliament. The Five Star League's strong anti-immigration stance includes recent plans for mass deportations for migrants who are undocumented.

Continued rapid immigration may foster additional support for far-right parties and the ethnic-nationalist identities that support them.¹²⁵ It is clear from this that the migrant crisis is being used to fuel the far-right, nationalist political parties in Europe. The evolvement of the refugee crisis in Europe has differed since the 1990s as a major perspective shift has presented itself. During 1991 and 1992 with Bosnians, the main concerns were problems related to logistics. The issue was due to a great inflow of migrants in a too short period of time.¹²⁶ However, unlike recent years, the overall majority wanted to help as refugees were seen in a positive light. In 2015, refugees had a negative connotation because they were seen more as a threat. The fundamental difference now is that refugees have been categorized to the extent where there is a lack of sympathy from the past years. The fact that many of the refugees coming to Europe are fleeing to escape the effect of climate change, more specifically issues relating to water scarcity, is one of the ways that climate change is intensifying the rise of the far-right in Europe.

 ¹²³ Scarsi, Alice. "Hungary election 2018 RESULTS Live: Latest news as Viktor Orban 'DECLARES VICTORY." *Express*, 9 Apr. 2018, www.express.co.uk/news/world/943160/Hungary-election-2018-results-live-polls.
¹²⁴ "Europe and nationalism: A country-by-country guide." *BBC News*, 10 Sept. 2018,

www.bbc.com/news/world-europe-36130006.

¹²⁵ Davis, Lewis, and Sumit S. Deole. "Immigration and the Rise of Far-Right Parties in Europe." *DICE Report*, vol. 15, 4 Dec. 2017, www.cesifo-group.de/DocDL/dice-report-2017-4-davis-deole-december.pdf.

¹²⁶ Einbinder, Nicole. "How the Far Right Has Reshaped the Refugee Debate in Europe." PBS, Public Broadcasting Service, www.pbs.org/wgbh/frontline/article/how-the-far-right-has-reshaped-the-refugee-debate-in-europe/.

Climate Refugees

The rise in climate refugees will increase with more than



people

350,000

Average number of asylum applications in the EU from 103 countries between 2000 and 2014



There is a trend correlating with weather and changes in the number of asylum applications

The Rise in Right Wing Politicians in Europe



Afterword

Water is life. Without it, we cannot exist. However, it seems that because of it, we struggle to co-exist. It is the key to health, to economic development, and to peace. In efforts to educate and inform, we, the UNIS-UN Executive Committee, invited these speakers to help you think about the information you receive on a daily basis and to further expand your awareness of the water crisis. We hope that each speaker has provided you with a unique perspective regarding both the geopolitical and environmental implications related to the world's water.

The objective of this year's Working Paper was to explore all facets of this issue. We hope to be a foundation that allows you to begin your own discussions, raise awareness, and share your knowledge. The future lies in our hands and we will determine how the next generation will have access to water.

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